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ONTARIO COLLEGE OF PHARMACY
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C. HERBERT PACKARD
President of the American Pharmaceutical Association 1920-1921.

Charles Herbert Packard was born in Amherst, Mass., in 1863. He was educated in the public schools of Boston, and Arms Academy, Shelburne Falls, Mass., and graduated from Massachusetts College of Pharmacy in 1892. Mr. Packard entered the retail drug business in Boston in 1880. He was the first president of the New England Branch A. Ph. A., local secretary of the American Pharmaceutical Association in 1910-1911, and chairman of its Membership Committee in 1913. He was president of the Massachusetts State Pharmaceutical Association in 1907, and has been treasurer of the Boston Retail Druggists' Association since its organization. Mr. Packard's presidential address is printed in the September issue Journal A. Ph. A., for 1921, pp. 655-668.

YEAR BOOK

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION

1920

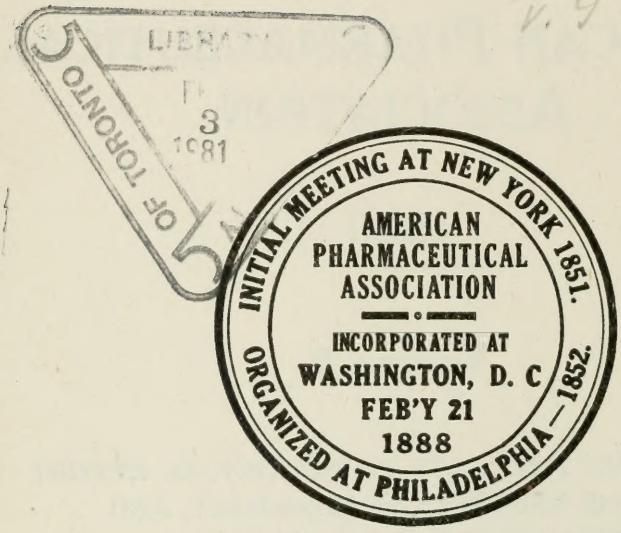
Volume 9

CONTAINING THE SIXTY-THIRD ANNUAL REPORT
ON THE PROGRESS OF PHARMACY, AND
THE CONSTITUTION, BY-LAWS,
AND ROLL OF MEMBERS

CORRESPONDING TO VOLUME SIXTY-EIGHT OF THE
FORMER PROCEEDINGS OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

CHICAGO, ILL.
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Virginia—C. F. WALKER, *Chairman*, Richmond.
W. F. RUDD, Richmond.
MAUDE LAMBERT, Roanoke.
W. W. ROLSTON, Harrisonburg.
I. F. KNOCK, Petersburg.
J. A. LYLE, Richmond.
R. S. HOPKINS, East Radford.
SAMUEL WEINSTEIN, Richmond.
A. L. WINNE, Richmond.

West Virginia—ALFRED WALKER, *Chairman*, Sutton.
G. O. YOUNG, Buckhannon.

New York—J. LEON LASCOFF, *Chairman*, New York.
L. BERGER, New York.
EDWARD S. DAWSON, JR., Syracuse.
GEORGE C. DIEKMAN, New York.
JACOB DINER, New York.
OTTO RAUBENHEIMER, Brooklyn.
GEORGE REIMANN, Buffalo.
FREDERICK P. TUTHILL, Brooklyn.

Maryland—C. L. MEYER, *Chairman*, Baltimore.
JAMES A. BLACK, Baltimore.
ALBERT L. PEARRE, Frederick.
GEORGE E. PEARCE, Frostburg.

District of Columbia—LOUIS FLEMER, *Chairman*, Washington.
S. L. HILTON, Washington.
H. E. KALUSOWSKI, Washington.

Delaware—JOHN O. BOSLEY, *Chairman*, Wilmington.
REUBEN M. KAUFMAN, Seaford.
HERBERT K. WATSON, Wilmington.

Pennsylvania—P. H. UTECH, *Chairman*, Meadville.
JOSEPH W. ENGLAND, Philadelphia.
CHARLES F. KRAMER, Harrisburg.
AMBROSE HUNSBERGER, Philadelphia.
LOUIS SAALBACH, Pittsburgh.
L. L. WALTON, Williamsport.

District No. 3.—Chairman, LEONARD A. SELTZER, 60 Adams Street, West, Detroit, Michigan. *Including* Ohio, Indiana, Illinois, Kentucky, Michigan, Missouri and Kansas.

Illinois—WM. GRAY, *Chairman*, Chicago.
PAUL G. SCHUH,* Cairo.
JOHN C. WHEATCROFT, Grayville.
S. F. SCHICK, Joliet.

Ohio—EDWARD SPEASE, *Chairman*, Cleveland.
WALDO M. BOWMAN, Toledo.
LEWIS C. HOPP, Cleveland.
THEO. D. WETTERSTROEM, Columbus.
A. L. FLANDERMEYER, Cleveland.
F. H. FREERICKS, Cincinnati.
M. N. FORD, Columbus.
E. C. DAVIS, Akron.
C. W. ANTONY, Canton.
O. U. CASSIDY, Youngstown.
ELIZABETH JENKINS, Dayton.

Indiana—F. W. MEISSNER, JR., *Chairman*, La Porte.
C. B. JORDAN, Lafayette.
EMIL REYER, South Bend.
W. H. RUDDER, Salem.
R. L. GREEN, Notre Dame.

Kentucky—OSCAR DILLY, *Chairman*, Louisville.
ADDISON DIMMITT, Louisville.
J. W. GAYLE, Frankfort.
EDWARD L. PIECK, Covington.

*Deceased.

Michigan—L. A. SELTZER, *Chairman*, Detroit.
A. A. WHEELER, Detroit.
WILLIAM C. KIRCHGESSNER, Grand Rapids.
HARRY B. MASON, Detroit.

Missouri—J. MERNER NOBLE, *Chairman*, St. Louis.
H. M. WHELPLEY, St. Louis.
H. V. TINDALL, Excelsior Springs.
R. A. DOYLE, East Prairie.
WM. MITTELBACH, Booneville.
MRS. MINNIE M. WHITNEY, Kansas City.
FRANCIS HEMM, St. Louis.
ALFRED W. PAULEY, St. Louis.
MARTIN J. NOLL, St. Louis.

Kansas—MATHIAS NOLL, *Chairman*, Atchison.
L. D. HAVENHILL, Lawrence.
J. S. CHISM, Wichita.
MAXIMILLIAN W. FRIEDENBURG, Winfield.
EDWARD DORSEY, Ottawa.
DAVID F. DEEM, Stark.
OSCAR JOSEPH SCHMITZ, Atchison.

District No. 4.—Chairman, W. H. ZIEGLER, Medical College of S. C., 213 Rutledge Ave., Charleston, S. C. *Including* North Carolina, South Carolina, Tennessee, Georgia, Alabama, Mississippi, Florida, Arkansas, Louisiana, Oklahoma, Texas, Panama, Cuba.

Alabama—CARL WHORTON, *Chairman,* Gadsden.
W. E. BINGHAM, Tuscaloosa.
BERNHARD H. EICHOLD, Mobile.
LAWRENCE C. LEWIS, Tuskegee.
W. P. THOMASON, Guntersville.

Arkansas—FRANK SCHACHLEITER, *Chairman,* Little Rock.
M. A. EISELE, Hot Springs.
MAYNARD H. POTTER, Piggott.

Cuba—JOSE GUILLERMO DIAZ, *Chairman,* Havana.
JOSE P. ALACAN, Havana.
ALIRIO DIAZ GUERRA, Brooklyn, N. Y.

Florida.—M. M. TAYLOR, *Chairman,* Tampa.
E. BERGER, Tampa.
H. H. D'ALEMBERTE, Pensacola.
D. W. RAMSAUR, Jacksonville.

Georgia—ROBERT H. LAND, JR., *Chairman,* Augusta.
SINCLAIR S. JACOBS, Atlanta.
R. A. ROWLINSKI, Savannah.
ROBERT THOMAS, JR., Thomasville.

Louisiana—R. F. GRACE, *Chairman,* New Orleans.
FABIUS C. GODBOLD, New Orleans.
ADAM WIRTH, New Orleans.
WILLIAM AUGUST WORNER, New Orleans.
MARTIAL B. CASTEIX, New Orleans.

Mississippi—HENRY M. FASER, *Chairman,* University.
GUS C. KENDALL, Meredian.
C. E. ANDING, Flora.

Texas—ROBERT. H. WALKER, *Chairman,* Gonzales.
J. M. DUGGAN, Cuero.
L. J. BUTTERY, San Angelo.

Panama—BOLÍVAR JURADO, *Chairman,* Panama City.
OSWALD CHAPMAN, Panama City.

Oklahoma — H. S. CALDWELL, *Chairman,* Oklahoma City.
WALTER R. JARRET, Oklahoma City.
EDWIN DEBARR, Norman.
FRANK A. DINKLER, Hennesey.

North Carolina –J. G. BEARD, *Chairman,* Chapel Hill.
K. E. BENNETT, Bryson City.
CHARLES P. GREYER, Morgantown.
W. W. HORN, Fayetteville.
EDWARD V. ZOELLER, Tarboro.

South Carolina—JOSEPH B. HYDE, *Chairman,* Charleston.
S. C. HODGES, Greenwood.
D. T. RILEY, Florence.

Tennessee—WILLIAM R. WHITE, *Chairman,* Nashville.
IRA B. CLARK, Nashville.
E. V. SHEELEY, Memphis.
H. M. OLIVER, Union Ctiy.

District No. 5.—Chairman, E. L. NEWCOMB, 719 6th Ave., S. E., Minneapolis, Minn. Including Montana, Wisconsin, Iowa, Nebraska, Minnesota, North Dakota, and South Dakota.

Iowa—AL. FALKENHAINER, *Chairman,* Algona.
G. SCHERLING, Sioux City.
ELBERT O. KAGY, Des Moines.
JOHN M. LINDLY, Des Moines.
WILBER J. TEETERS, Iowa City.
GEO. JUDISCH, Ames.
J. W. BALLARD, Davenport.
GEO. A. KIEDAISCH, Keokuk.

Minnesota—G. BACHMAN, *Chairman,* Minneapolis.
WILLIAM A. ABBETT, Duluth.
WM. A. FROST, St. Paul
CHAS. H. HUHN, Minneapolis.
ROBERT L. MORLAND, Worthington.
J. H. BEISE, Fergus Falls.
JOHN NELSON, Lake Park.
C. M. JUDD, Rochester.
R. J. MESSING, St. Paul.

Nebraska—R. A. LYMAN, *Chairman,* Lincoln.
HENRY R. GERING, Omaha.
H. C. NEWTON, Omaha.
D. J. FINK, Holdredge.
NIELS MIKKELSEN, Kenesaw.

North Dakota—W. P. PORTERFIELD, *Chairman,* Fargo.
W. S. PARKER, Lisbon.
ROY G. COOK, Fargo.
HOMER L. HILL, Marion.
WM. F. SUDRO, Fargo.
OSCAR HALLENBERG, Fargo.
HENRY L. HAUSSAMEN, Grafton.

South Dakota—ANTON HOGSTAD, JR., *Chairman.* Brookings.
E. C. BENT, Dell Rapids.
DAVID F. JONES, Watertown.
JAMES ARTHUR POOL, Redfield.
P. H. CLUTE, Big Stone City.
S. H. SCALLIN, Mitchell
L. T. DUNNING, Sioux Falls.
J. M. STALEY, Watertown.
FRED L. VILAS, Pierre.
EARL R. SERLES, Brookings.

Montana—CHARLES E. F. MOLLETT, *Chairman,* Missoula.
J. W. SEIDEN, Lewistown.
W. R. MONTGOMERY, Butte.
EMIL STARZ, Helena.
FRANK A. SCHEUBER, Livingston.

Wisconsin—E. G. RAUEBER, *Chairman,* Milwaukee.
O. J. S. BOBERG, Eau Claire.
B. J. KREMER, Fond du Lac.
EDW. KREMERS, Madison.
H. G. RUENZEL, Milwaukee.
W. W. ALBERS, Wausau.
H. P. REIF, Madison.

District No. 6.—Chairman, JOSEPH L. LENGFELD, 1505 Gough Street, San Francisco, California. *Including* California, Nevada, Utah, Colorado, New Mexico.

California—JOSEPH L. LENGFELD, Chairman, San Francisco.
FRANKLIN T. GREEN, San Francisco.
W. BRUCE PHILIP, Oakland.
GEORGE H. P. LICHTHARDT, Sacramento.
J. G. MUNSON, San José.
A. R. MAAS, Los Angeles.

Colorado—FRANK E. MORTENSON, *Chairman,* Pueblo.
W. T. HOVER, Denver.

CHARLES J. CLAYTON, Denver.
E. G. FINE, Boulder.
Nevada—JOSEPH C. PIERCY, *Chairman*, Tonopah.
W. R. ENGLERT, Elko.
New Mexico—BERNARD C. RUPPE, *Chairman*, Albuquerque.
Utah—JOHN CULLEY, *Chairman*, Ogden.
W. H. DAYTON, Salt Lake City.
W. L. EDDY, Brigham City.

District No. 7.—Chairman, A. W. LINTON, Coll. of Pharm., Univ. of Wash. Seattle, Washington. *Including* Washington, Oregon, Idaho, Wyoming, Alaska.

Idaho— H. H. WHITTLESEY, *Chairman*, Pocatello.
CLARENCE O. BALLOU, Boise.
ROY M. SPARGUR, Twin Falls.
JOHN J. BUEHLER, Pocatello.
Oregon—ADOLPH ZIEFLE, *Chairman*, Corvallis.
GEORGE C. BLAKELEY, The Dalles.
J. LEE BROWN, Marshfield.
LOUIS G. CLARKE, Portland.
Alaska—GUY L. SMITH, *Chairman*, Douglas.
ZACHARY J. LOUSSAC, Anchorage.
Wyoming—ORVILLE A. BEATH, *Chairman*, Laramie.
ANDREW EDWARD ROEDEL, Cheyenne.
Washington—CHARLES W. JOHNSON, *Chairman*, Seattle.
G. C. NORTON, Tacoma.
MRS. EMILY C. MCRAE, Spokane.
CORNELIUS OSSEWARD, Seattle.
H. G. DUERFELDT, Spokane.

District No. 8, Canada.—Chairman, CHARLES F. HEEBNER, Ontario College of Pharmacy, Toronto. Ontario.

ALEXANDER B. J. MOORE, Montreal, Quebec.
HENRY E. J. BLETCHER, Winnipeg Manitoba
ALEXANDER STEWART, Guelph, Ontario.

ORGANIZATION OF LOCAL BRANCHES 1921.

Baltimore Branch

J. C. KRANTZ, JR., *President*. MISS B. OLIVE COLE, *Secretary*.
CHARLES C. NEAL, *Council Representative*.

Birmingham Branch

Recently established. No officers reported.

Chicago Branch

CLYDE M. SNOW, *President*. E. N. GATHERCOAL, *Secretary*.
CLYDE M. SNOW, *Council Representative*.

Cincinnati Branch

EDWARD VOSS, JR., *President*. CHARLES APMEYER, *Secretary*.
C. T. P. FENNEL, *Council Representative*.

Montana Branch

C. E. MOLLETT, *President*. ALEX F. PETERSON, *Secretary*.
C. E. MOLLETT, *Council Representative*.

Nashville Branch

L. S. PULLY, *President*. WILLIAM R. WHITE, *Secretary*.
WILLIAM R. WHITE, *Council Representative*

Nebraska Branch

A. V. PEASE, *President*. ALBERT SCHNEIDER, *Secretary*.
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New England Branch

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F. J. WULLING, *Council Representative*.

Columbus Branch

———, *President.* ———, *Secretary.*
CLAIR A. DYE, *Council Representative.*

Denver Branch

BERT W. STRICKLAND, *President.* CHAS. J. CLAYTON, *Secretary.*
SAMUEL T. HENSEL, *Council Representative.*

Detroit Branch

WALTER M. CHASE, *President.* CROSBY B. WASHBURNE, *Secretary.*
LEONARD A. SELTZER, *Council Representative*

Indianapolis Branch

A. D. THORBURN, *President.* M. P. SCHWARTZ, *Secretary.*
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JOSEPH W. ENGLAND, *President.* J. W. E. HARRISSON, *Secretary.*
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Pittsburgh Branch

HENRY L. LOHMEYER, *President.* B. E. PRITCHARD, *Secretary.*
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W. G. CROCKETT, *President.* A. L. I. WINNE, *Secretary.*
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MISS C. M. ROEHR, *Council Representative.*

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B. H. ST. JOHN, *President.* LESLIE PRICHARD, *Secretary.*
J. MERNER NOBLE, *Council Representative.*

Washington, D. C., Branch

A. G. DUMEZ, *President.* H. C. FULLER, *Secretary.*
H. C. FULLER, *Council Representative.*

Havana, Cuba, Branch

JOSE G. DIAZ, *President.* JOSE P. ALACAN, *Secretary.*

LIST OF OFFICERS OF THE ASSOCIATION SINCE ITS ORGANIZATION

(NAMES OF DECEASED OFFICERS IN ITALICS)

Date	Place of Meeting	Presidents	First Vice-Presidents	Second Vice-Presidents	Third Vice-Presidents
Oct. 6, 1852	Philadelphia, Pa.	*Daniel B. Smith*, Philadelphia.	*George W. Andrews*, Baltimore.	*Samuel M. Colcord*, Boston	*C. Augustus Smith*, Cincinnati
Aug. 24, 1853	Boston, Mass.	*William A. Brewer*, Boston.	*George D. Coggeshall*, New York.	*Alexander Duval*, Richmond, Va.	*Charles B. Guthrie*, Memphis, Tenn.
July 25, 1854	Cincinnati, O	*William B. Chapman*, Cincinnati.	*Henry T. Cummings*, Portland, Me.	*John Meakim*, New York.	*Joseph Laidley*, Richmond, Va.
Sept. 11, 1855	New York, N. Y.	*John Meakim*, New York.	*Charles B. Guthrie*, Memphis, Tenn.	*Charles Ellis*, Philadelphia.	*Henry F. Fish*, Waterbury, Conn.
Sept. 9, 1856	Baltimore, Md.	*George W. Andrews*, Baltimore.	*John I. Kidwell*, Washington, D. C.	*Frederick Stearns*, Detroit, Mich.	*Henry T. Kiersted*, New York.
Sept. 8, 1857	Philadelphia, Pa.	*Charles Ellis*, Philadelphia.	*James Cooke*, Fredericksburgh, Va.	*Samuel P. Peck*, Bennington, Vt.	*A. E. Richards*, Plaquemine, La.
Sept. 14, 1858	Washington, D. C.	*John I. Kidwell*, Georgetown, D. C.	*Edward R. Squibb*, Brooklyn, N. Y.	*James O'Gallagher*, St. Louis.	*Robert Battey*, Rome, Ga.
Sept. 13, 1859	Boston, Mass.	*Samuel M. Colcord*, Boston.	*William Procter, Jr.*, Philadelphia.	*Joseph Roberts*, Baltimore.	*Edwin O. Gale*, Chicago.
Sept. 11, 1860	New York, N. Y.	*Henry T. Kiersted*, New York.	*William J. M. Gordon*, Cincinnati.	*William S. Thompson*, Baltimore.	*Theodore Metcalf*, Boston.
Aug. 27, 1862	Philadelphia, Pa.	*Wm. Procter, Jr.*, Philadelphia.	*John Milhau*, New York.	*Eugene L. Massot*, St. Louis.	*J. Faris Moore*, Baltimore.
Sept. 8, 1863	Baltimore, Md.	*J. Faris Moore*, Baltimore.	*John M. Maisch*, Philadelphia.	*Chas. A. Tufts*, Dover, N. H.	*George W. Weyman*, Pittsburgh.
Sept. 21, 1864	Cincinnati, O.	*William J. M. Gordon*, Cincinnati.	*Richard H. Stabler*, Alexandria.	*Enno Sander*, St. Louis.	*Thomas Hollis*, Boston.
Sept. 5, 1865	Boston, Mass.	*Henry W. Lincoln*, Boston.	*George C. Close*, Brooklyn, N. Y.	*Elijah W. Sackrider*, Cleveland, O.	*Charles A. Heinitsh*, Lancaster, Pa.

LIST OF OFFICERS (Continued)

Date	Place of Meeting	Presidents	First Vice-Presidents	Second Vice-Presidents	Third Vice-Presidents
Aug. 22, 1866	Detroit, Mich.	*Frederick Stearns*, Detroit, Mich.	*Edward Parrish*, Philadelphia	*Ezekiel H. Sargent*, Chicago	*John W. Shedden*, New York
Sept. 10, 1867	New York, N. Y.	*John Milhau*, New York	*Robert J. Brown*, Leavenworth, Kans.	*N. Hynson Jennings*, Baltimore	*Daniel Henchman*, Boston.
Sept. 8, 1868	Philadelphia, Pa.	*Edward Parrish*, Philadelphia.	*Ferris Bringhurst*, Wilmington, Del.	*Edward S. Wayne*, Cincinnati.	*Albert E. Ebert*, Chicago
Sept. 7, 1869	Chicago, Ill.	*Ezekiel H. Sargent*, Chicago.	*Ferdinand W. Sennewald*, St. Louis.	*John J. Pope*, New Orleans.	*Joel S. Orne*, Cambridgeport, Mass.
Sept. 13, 1870	Baltimore, Md.	*Richard H. Stabler*, Alexandria, Va.	*Fleming G. Grieve*, Milledgeville, Ga.	*James G. Steele*, San Francisco.	*Eugene L. Massot*, St. Louis.
Sept. 12, 1871	St. Louis, Mo.	*Enno Sander*, St. Louis.	*C. Lewis Diehl*, Louisville, Ky.	*George F. H. Markoe*, Boston.	*Matthew F. Ash*, Jackson, Miss.
Sept. 3, 1872	Cleveland, O.	*Albert E. Ebert*, Chicago	*Samuel S. Garrigues*, E. Saginaw, Mich.	*Edward P. Nichols*, Newark, N. J.	*Henry C. Gaylord*, Cleveland, O.
Sept. 16, 1873	Richmond, Va.	John F. Hancock, Baltimore.	*William Saunders*, London, Ont.	*John T. Buck*, Jackson, Miss.	*Paul Balluff*, New York.
Sept. 8, 1874	Louisville, Ky.	*C. Lewis Diehl*, Louisville, Ky.	*Joseph Roberts*, Baltimore.	*William T. Wenzell*, San Francisco.	*Augustus R. Bayley*, Cambridgeport, Mass.
Sept. 7, 1875	Boston, Mass.	*George F. H. Markoe*, Boston.	*Frederick Hoffman*, New York.	*T. Roberts Baker*, Richmond, Va.	*Christian F. G. Meyer*, St. Louis.
Sept. 12, 1876	Philadelphia, Pa.	*Charles Bullock*, Philadelphia.	*Samuel A. D. Sheppard*, Boston.	*Gustavus J. Luhn*, Charleston, S. C.	*Jacob D. Wells*, Cincinnati.
Sept. 4, 1877	Toronto, Can.	*William Saunders*, London, Ont.	*Ewen McIntyre*, New York.	*John Ingalls*, Macon, Ga.	*Emlen Painter*, San Francisco.

Date	Place of Meeting	Presidents	First Vice-Presidents	Second Vice-Presidents	Third Vice-Presidents
Nov. 26, 1878	Atlanta, Ga.	*Gustavus J. Luhn*, Charleston, S. C.	*Frederick T. Whiting*, Great Barrington, Mass.	*Henry J. Rose*, Toronto, Can.	*William H. Crawford*, St. Louis.
Sept. 9, 1879	Indianapolis, Ind.	*George W. Sloan*, Indianapolis, Ind.	*T. Roberts Baker*, Richmond, Va.	Joseph L. Lemberger, Lebanon, Pa.	*Philip C. Candidus*, Mobile, Ala.
Sept. 14, 1880	Saratoga, N. Y.	*James T. Shinn*, Philadelphia.	George H. Schafer, Fort Madison, Ia.	*William S. Thompson*, Washington, D. C.	*William Simpson*, Raleigh, N. C.
Aug. 23, 1881	Kansas City, Mo.	*P. Wendover Bedford*, New York.	*Emlen Painter*, San Francisco	*George Leis*, Lawrence, Kans.	*John F. Judge*, Cincinnati.
Sept. 12, 1882	Niagara Falls, N.Y.	*Charles A. Heinitch*, Lancaster, Pa.	*John Ingalls*, Macon, Ga.	*Louis Dohme*, Baltimore.	*William B. Blanding*, Providence, R. I.
Sept. 11, 1883	Washington, D. C.	*William S. Thompson*, Washington, D. C.	*Charles Rice*, New York.	*Frederick H. Masi*, Norfolk, Va.	Edward W. Runyon, San Francisco.
Aug. 26, 1884	Milwaukee, Wis.	*John Ingalls*, Macon, Ga.	*John A. Dadd*, Milwaukee, Wis.	*Henry Canning*, Boston.	*Charles F. Goodman*, Omaha, Neb.
Sept. 8, 1885	Pittsburgh, Pa.	*Joseph Roberts*, Baltimore.	*Albert H. Hollister*, Madison, Wis.	*Albert B. Prescott*, Ann Arbor, Mich.	*Joseph S. Evans*, West Chester, Pa.
Sept. 7, 1886	Providence, R. I.	*Chas. A. Tufts*, Dover, N. H.	*Henry J. Menninger*, Brooklyn, N. Y.	*M. W. Alexander*, St. Louis.	*Norman A. Kuhn*, Omaha, Neb.
Sept. 5, 1887	Cincinnati, O.	John U. Lloyd, Cincinnati.	*M. W. Alexander*, St. Louis.	*A. K. Finlay*, New Orleans.	*Karl Simmons*, St. Paul, Minn.
Sept. 3, 1888	Detroit, Mich.	*M. W. Alexander*, St. Louis.	Jas. Vernor, Detroit, Mich.	Fred Wilcox, Waterbury, Conn.	*Alvin A. Yeager*, Knoxville, Tenn.
June 24, 1889	San Francisco, Cal.	*Emlen Painter*, New York.	*Karl Simmons*, St. Paul, Minn.	*Wm. M. Searby*, San Francisco.	*Joseph W. Eckford*, Aberdeen, Miss.
Sept. 8, 1890	Old Pt. Comfort, Va.	*A. B. Taylor*, Philadelphia.	A. B. Stevens, Ann Arbor, Mich.	*Chas. E. Dohme*, Baltimore.	*James M. Good*, St. Louis.
April 27, 1891	New Orleans, La.	*A. K. Finlay*, New Orleans.	*Geo. J. Seabury*, New York.	W. H. Torbert, Dubuque, Ia.	*L. T. Dunning*, Sioux Falls, S. D.

LIST OF OFFICERS (Continued)

Date	Place of Meeting	Presidents	First Vice-Presidents	Second Vice-Presidents	Third Vice-Presidents
July 14, 1892	Profile House, N. H.	*Jos. P. Remington*, Philadelphia.	*A. P. Preston*, Portsmouth, N. H.	*Sidney P. Watson*, Atlanta, Ga.	*Wm. H. Averill*, Frankfort, Ky.
Aug. 14, 1893	Chicago, Ill.	Edgar L. Patch Boston.	*Leo Eliel*, South Bend, Ind.	*Wiley Rogers*, Louisville, Ky.	*Chas. Caspari, Jr.*, Baltimore.
Sept. 3, 1894	Asheville, N. C.	*William Simpson*, Raleigh, N. C.	Chas. M. Ford, Denver, Colo.	Jno. N. Hurty, Indianapolis, Ind.	*Jas. E. Morrison*. Montreal, Can.
Aug. 14, 1895	Denver, Colo.	*James M. Good*, St. Louis.	*Chas. E. Dohme*, Baltimore.	A. Brandeburger, Jefferson City, Mo.	*Mrs. M. O. Miner*, Hiawatha, Kans.
Aug. 12, 1896	Montreal, Can.	*Joseph E. Morrison*, Montreal, Can.	Geo. F. Payne, Atlanta, Ga.	Wm. A. Frost, St. Paul, Minn.	Geo. W. Parisen, Perth Amboy, N. J.
Aug. 23, 1897	Lake Minnetonka, Minn.	*Henry M. Whitney*, Lawrence, Mass.	*George C. Bartells*, Camp Point, Ill.	*Wm. S. Thompson*, Washington, D. C.	*Jacob A. Miller*, Harrisburg, Pa.
Aug. 29, 1898	Baltimore, Md.	*Charles E. Dohme*, Baltimore.	George F. Payne, Atlanta, Ga.	James H. Beal, Scio, O.	Josie A. Wanous, Minneapolis, Minn.
Sept. 4, 1899	Put-in-Bay, O.	*Albert B. Prescott*, Ann Arbor, Mich.	Lewis C. Hopp, Cleveland, O.	*Wm. L. Dewoody*, Pine Bluff, Ark.	*Henry R. Gray*, Montreal, Can.
May 7, 1900	Richmond, Va.	*Jno. F. Patton*, York, Pa.	James H. Beal, Scio, O.	Jno. W. Gayle, Frankfort, Ky.	E. A. Ruddiman, Nashville, Tenn.
Sept. 16, 1901	St. Louis, Mo.	Henry M. Whelpley, St. Louis.	*Wm. M. Searby*, San Francisco.	George F. Payne, Atlanta, Ga.	*Wm. S. Thompson*, Washington, D. C.
Sept. 8, 1902	Philadelphia, Pa.	Geo. F. Payne, Atlanta, Ga.	Wm. L. Cliffe, Philadelphia, Pa.	Eugene G. Eberle, Dallas, Texas.	*Henry Willis*, Quebec, Can.
Aug. 3, 1903	Mackinac Island, Mich.	Lewis C. Hopp, Cleveland, O.	*Wm. C. Alpers*, New York.	*Albert M. Roehrig*, Stapleton, N. Y.	Otto F. Claus, St. Louis, Mo.
Sept. 5, 1904	Kansas City, Mo.	James H. Beal, Scio, O.	*Philip C. Candidus*, Mobile, Ala.	Wm. Mittelbach, Boonville, Mo.	Julius A. Koch, Pittsburgh, Pa.
Sept. 4, 1905	Atlantic City, N. J.	Jos. L. Lemberger, Lebanon, Pa.	*Chas. Holzhauer*, Newark, N. J.	Chas. A. Rapelye, Hartford, Conn.	Fabius C. Godbold, New Orleans, La.

Date	Place of Meeting	Presidents	First Vice-Presidents	Second Vice-Presidents	Third Vice-Presidents
Sept. 3, 1906	Indianapolis, Ind.	*Leo Eliel*, South Bend, Ind.	Wm. Mittelbach, Boonville, Mo.	*C. S. N. Hallberg*, Chicago, Ill.	*Thomas P. Cook*, New York, N. Y.
Sept. 2, 1907	New York, N. Y.	*Wm. M. Searby*, San Francisco, Cal.	*Oscar Oldberg*, Chicago, Ill.	Henry H. Rusby, New York, N. Y.	Oscar W. Bethea, Meridian, Miss.
Sept. 7, 1908	Hot Springs, Ark.	*Oscar Oldberg*, Chicago, Ill.	Eugene G. Eberle, Dallas, Texas.	Wm. Mittelbach, Boonville, Mo.	James H. Beal, Scio, O.
Aug. 16, 1909	Los Angeles, Cal.	Henry H. Rusby, Newark, N. J.	Clement B. Lowe, Philadelphia, Pa.	Chas. W. Johnson, Seattle, Wash.	Wm. B. Day, Chicago, Ill.
May 2, 1910	Richmond, Va.	Eugene G. Eberle, Dallas, Texas.	Wm. B. Day, Chicago, Ill.	Otto F. Claus, St. Louis, Mo.	Leonard A. Seltzer, Detroit, Mich.
Aug. 14, 1911	Boston, Mass.	John G. Godding, Boston, Mass.	W. Bodemann, Chicago, Ill.	Chas. M. Ford, Denver, Colo.	Ernest Berger, Tampa, Fla.
Aug. 19, 1912	Denver, Colo.	William B. Day, Chicago, Ill.	Chas. M. Ford, Denver, Colo.	Caswell A. Mayo, New York, N. Y.	C. Herbert Packard, East Boston, Mass.
Aug. 18, 1913	Nashville, Tenn.	George M. Beringer, Camden, N. J.	*Franklin M. Apple*, Philadelphia, Pa.	Wm. S. Richardson, Washington, D. C.	L. D. Havenhill, Lawrence, Kans.
Aug. 24, 1914	Detroit, Mich.	Caswell A. Mayo, New York, N. Y.	L. D. Havenhill, Lawrence, Kans.	C. Herbert Packard, East Boston, Mass.	Charles Gietner, St. Louis, Mo.
Aug. 9, 1915	San Francisco, Cal.	*Wm. C. Alpers*, Cleveland, O.	C. H. LaWall, Philadelphia, Pa.	E. A. Ruddiman, Nashville, Tenn.	Linwood A. Brown, Lexington, Ky.
Sept. 5, 1916	Atlantic City, N. J.	Fred J. Wulling, Minneapolis, Minn.	Leonard A. Seltzer, Detroit, Mich.	Lucius E. Sayre, Lawrence, Kans.	*Philip Asher*, New Orleans, La.
Aug. 28, 1917	Indianapolis, Ind.	*Charles Holzhauer*, Newark, N. J.	Alfred R. L. Dohme, Baltimore, Md.	Leonard A. Seltzer, Detroit, Mich.	Theodore J. Bradley, Boston, Mass.
Aug. 12, 1918	Chicago, Ill.	Charles H. LaWall, Philadelphia, Pa.	F. W. Nitardy, Brooklyn, N. Y.	Theodore J. Bradley, Boston, Mass.	Francis Hemm, St. Louis, Mo.
Aug. 25, 1919	New York, N. Y.	L. E. Sayre, Lawrence, Kans.	Theo. J. Bradley, Boston, Mass.	Harry Whitehouse, Johnson City, Tenn.	E. Fullerton Cook, Philadelphia, Pa.
May 6, 1920	Washington, D. C.	C. Herbert Packard, East Boston, Mass.	E. Fullerton Cook, Philadelphia, Pa.	Charles E. Caspari St. Louis, Mo.	W. P. Porterfield, Fargo, N. D.

HONORARY PRESIDENTS

Philip C. Candidus, Mobile, Ala., 1907-08.
Samuel A. D. Sheppard, Boston, Mass., 1908-09.
Enno Sander, St. Louis, Mo., 1909-10.
Ewen McIntyre, New York, N. Y., 1910-11.
Henry Biroth, Chicago, Ill., 1911-12.
Thomas F. Main, New York, N. Y., 1912-13.
Albert B. Lyons, Detroit, Mich., 1913-14.
Geo. H. Schafer, Ft. Madison, Ia., 1914-15.
Fabius C. Godbold, New Orleans, La., 1915-16.
J. O. Burge, Nashville, Tenn., 1916-17.
W. L. Dewoody, Pine Bluff, Ark., 1917-18.
Oliver F. Fuller, Chicago, Ill., 1918-19
Alviso B. Stevens, Escondido, Cal., 1919-20.
John F. Hancock, Baltimore, Md., 1920-21.

TREASURERS

Alfred B. Taylor, Philadelphia, 1852-54.
Samuel L. Colcord, Boston, 1854-56 and 1857-59.
James S. Aspinwall, New York, 1856-57.
Ashel Boyden, Boston, 1859-60.
Henry Haviland, New York, 1860-63.
J. Brown Baxley, Baltimore, Md., 1863-65.
Charles A. Tufts, Dover, N. H., 1865-86.
Samuel A. D. Sheppard, Boston, 1886-1908.
Henry M. Whelpley, St. Louis, 1908-21.

RECORDING SECRETARIES

George D. Coggeshall, New York, 1852-53.
Edward Parrish, Philadelphia, 1853-54.
Edward S. Wayne, Cincinnati, 1854-55.
William J. M. Gordon, Cincinnati, 1855-59.
Charles Bullock, Philadelphia, 1859-60.
James T. Shinn, Philadelphia, 1860-62.
Peter W. Bedford, New York, 1862-63.
William Evans, Jr., Philadelphia, 1863-64.
Henry N. Rittenhouse, Philadelphia, 1864-65.

CORRESPONDING SECRETARIES

William Procter, Jr., Philadelphia, 1852-53 and 1854-57.
William B. Chapman, Cincinnati, 1853-54.
Edward Parrish, Philadelphia, 1857-58.
Ambrose Smith, Philadelphia, 1858-59.
William Hegeman, New York, 1859-60.
Peter W. Bedford, New York, 1860-62 and 1863-65.
John M. Maisch, Philadelphia, 1862-63.

PERMANENT SECRETARIES

John M. Maisch, Philadelphia, 1865-Sept., 1893.
Henry M. Whelpley, St. Louis (acting), August, 1893.
Joseph P. Remington, Philadelphia, 1893-94.
Chas Caspari, Jr., Baltimore, 1894-96.

GENERAL SECRETARIES

Chas. Caspari, Jr., 1896-1911.
James H. Beal, Scio, Ohio, 1911-14.
Wm. B. Day, Chicago, Ill., 1914-21.

LOCAL SECRETARIES

For the meeting held in	
1867	*P. Wendover Bedford.*
1868	*Alfred B. Taylor.*
1869	*Henry W. Fuller.*
1870	*J. Faris Moore.*
1871	*William H. Crawford.*
1872	*Henry C. Gaylord.*
1873	*Thomas H. Hazard.*
1874	*Emil Scheffer.*
1875	*Samuel A. D. Sheppard.*
1876	Adolphus W. Miller.
1877	*Henry J. Rose.*
1878	*Jesse W. Rankin.*
1879	*Eli Lilly.*
1880	Charles F. Fish.
1881	*William T. Ford.*
1882	*Hiram E. Griffith.*
1883	*Charles Becker.*
1884	Henry C. Schranck.
1885	*George A. Kelley.*
1886	*William B. Blanding.*
1887	*George W. Voss.*
1888	James Vernor.
1889	Edward W. Runyon.
1890	*Charles E. Dohme.*
1891	*A. K. Finlay.*
1892	*H. M. Whitney.*
1893	*Henry Biroth.*
1894	W. G. Smith.
1895	Edm. L. Scholtz.
1896	*Joseph E. Morrison.*
1897	Edw. Shumpik.
1898	*Henry P. Hynson.*
1899	Lewis C. Hopp.
1900	T. Ashby Miller.
1901	H. M. Whelpley.
1902	William L. Cliffe.
1903	*F. W. R. Perry.*
1904	Joseph C. Wirthman.
1905	William C. Westcott.
1906	Frank H. Carter.
1907	*Thomas P. Cook.*
1908	Martin A. Eisele.
1909	Thomas W. Jones.
1910	T. Ashby Miller.
1911	C. Herbert Packard.
1912	Charles M. Ford.
1913	*James O. Burge.*
1914	Leonard A. Seltzer.
1915	*John H. Dawson.*
1916	*Chas. Holzhauer.*
1917	Francis E. Bibbins.
1918	E. N. Gathercoal.
1919	Hugo H. Schaefer.
1920	S. L. Hilton.
1921	George W. McDuff.

REPORTERS ON PROGRESS OF PHARMACY

C. L. Diehl, Louisville, Ky., 1873-91 and 1895-1915; *Chas. Rice*, New York, N. Y., 1891-92; Henry Kraemer, Philadelphia, Pa., 1892-95; J. A. Koch, Pittsburgh, Pa., 1915-16; H. V. Arny, New York, N. Y., 1916-21.

PAST AND PRESENT OFFICERS OF THE SECTIONS

Section on Commercial Interests.

	Chairman.	*Secretary.*
1887-88	*A. H. Hollister.*	*J. W. Colcord.*
1888-89	*A. H. Hollister.*	*J. W. Colcord.*

	Chairman.	*Secretary.*
1889-90	*Leo Eliel.*	F. B. Kilmer.
1890-91	*Henry Canning.*	*W. L. Dewoody.*
1891-92	W. H. Torbert.	Arthur Bassett.

Past and Present Officers of the Sections (*Continued*)

	Chairman.	*Secretary.*
1892-93	W. H. Torbert.	Arthur Bassett.
1893-94	*Wiley Rogers.*	*Jas. O. Burge.*
1894-95	*Geo. J. Seabury.*	*Jas. O. Burge.*
1895-96	*Geo. J. Seabury.*	Clay W. Holmes.
1896-97	Lewis C. Hopp.	E. D'Avignon.
1897-98	Joseph Jacobs.	Jas. H. Bobbitt.
1898-99	Joseph Jacobs.	Jas. H. Bobbitt.
1899-00	*James M. Good.*	Charles A. Rapelye.
1900-01	Charles A. Rapelye.	F. W. Messiner.
1901-02	F. W. Meissner.	E. G. Eberle.
1902-03	Thomas V. Wooten.	Wm. C. Anderson.
1903-04	*Wm. L. Dewoody.*	Robert C. Reilly.
1904-05	Charles R. Sherman.	Robert C. Reilly.
1905-06	*Henry P. Hynson.*	Herman D. Kniseley.
1906-07	Herman D. Kniseley.	Charles H. Avery.
1907-08	Jacob Diner.	George O. Young.
1908-09	Harry B. Mason.	Erich H. Ladish.
1909-10	Waldo M. Bowman.	G. H. P. Lichthardt.
1910-11	*Franklin M. Apple.*	Benj. E. Pritchard.
1911-12	Ernest Berger.	D. W. Ramsaur.
1912-13	Autumn V. Pease.	William R. White.
1913-14	C. G. Lindvall and H. B. Mason.	Grant W. Stevens.
1914-15	E. H. Thiesing.	David Stolz.
1915-16	R. S. Lehmann.	J. C. McGee.
1916-17	P. Henry Utech.	Robt. P. Fischelis.
1917-18	Robt. P. Fischelis.	F. W. Nitardy.
1918-19	E. Fullerton Cook.	H. S. Noel.
1919-20	H. S. Noel.	C. O. Lee.
1920-21	Adam Wirth.	C. W. Holzhauer

Section on Scientific Papers.

	Chairman.	*Secretary.*
1887-88	*T. Roberts Baker.*	A. B. Lyons.
1888-89	*Emlen Painter.*	H. M. Whelpley.
1889-90	Henry Whelpley.	C. F. Dare.
1890-91	E. L. Patch.	*C. S. N. Hallberg.*
1891-92	*C. S. N. Hallberg.*	H. W. Snow.
1892-93	C. T. P. Fennel.	*F. G. Ryan.*
1893-94	L. E. Sayre.	C. M. Ford.
1894-95	A. R. L. Dohme.	*George B. Kauffman.*
1895-96	S. P. Sadtler.	*W. C. Alpers.*
1896-97	*W. C. Alpers.*	V. Coblentz.
1897-98	Edward Kremers.	A. B. Lyons.
1898-99	Henry H. Rusby.	H. V. Arny.
1899-00	*Frank G. Ryan.*	Caswell A. Mayo.
1900-01	*Oscar Oldberg.*	Lyman F. Kebler.
1901-02	Lyman F. Kebler.	Jos. W. England.
1902-03	*J. O. Schlotterbeck.*	Jos. W. England.
1903-04	William A. Puckner.	Eustace H. Gane.
1904-05	Eustace H. Gane.	Charles E. Caspari.
1905-06	Charles E. Caspari.	Daniel Base.
1906-07	Reid Hunt.	Virgil Coblentz.
1907-08	Virgil Coblentz.	Chas. E. Vanderkleed.
1908-09	Charles E. Vanderkleed.	*Martin I. Wilbert.*
1909-10	*Martin I. Wilbert.*	Albert H. Clark.
1910-11	Albert H. Clark.	Wm. O. Richtmann.
1911-12	W. O. Richtmann.	Charles H. LaWall.
1912-13	Frank R. Eldred.	Freeman P. Stroup.
1913-14	Edsel A. Ruddiman.	Wilbur L. Scoville.
1914-15	H. Engelhardt.	William Mansfield.

Past and Present Officers of the Sections (*Continued*).

	Chairman.	*Secretary.*
1915-16	W. L. Scoville.	E. L. Newcomb.
1916-17	J. L. Turner.	W. W. Stockberger.
1917-18	W. W. Stockberger.	H. C. Fuller.
1918-19	E. N. Gathercoal.	A. G. DuMez.
1919-20	Jacob Diner.	A. G. DuMez.
1920-21	A. G. DuMez.	H. W. Youngken.

Section on Pharmaceutical Education.

	Chairman.	*Secretary.*
1887-88	R. F. Bryant.	W. P. DeForest.
1888-89	C. W. Day.	J. N. Hurty.

Section on Pharmaceutical Legislation.

	Chairman.	*Secretary.*
1887-88	*John F. Judge.*	H. M. Whelpley.
1888-89	*P. W. Bedford.*	L. E. Sayre.

Section on Education and Legislation.

	Chairman.	*Secretary.*
1889-90	*P. W. Bedford.*	A. B. Stevens.
1890-91	*William Simon.*	L. C. Hogan.
1891-92	A. B. Stevens.	L. C. Hogan.
1892-93	R. G. Eccles.	L. C. Hogan.
1893-94	R. G. Eccles.	L. C. Hogan.
1894-95	*James M. Good.*	*C. S. N. Hallberg.*
1895-96	*C. S. N. Hallberg.*	Jas. H. Beal.
1896-97	*C. S. N. Hallberg.*	Jas. H. Beal.
1897-98	James H. Beal.	H. Gordon Webster.
1898-99	A. B. Lyons.	C. B. Lowe.
1899-00	C. B. Lowe.	J. A. Koch.
1900-01	C. B. Lowe.	J. A. Koch.
1901-02	E. G. Eberle.	J. W. T. Knox.
1902-03	J. W. T. Knox.	Harry B. Mason.
1903-04	Harry B. Mason.	Wm. L. Cliffe.
1904-05	Harry B. Mason.	Wm. L. Cliffe.
1905-06	*Oscar Oldberg.*	Jos. W. England.
1906-07	*Oscar Oldberg.*	Jos. W. England.
1907-08	Jos. W. England.	Chas. H. LaWall.
1908-09	Jos. W. England.	Chas. H. LaWall.
1909-10	Charles H. LaWall.	Chas. W. Johnson.
1910-11	Charles W. Johnson.	W. J. Teeters.
1911-12	John C. Wallace.	W. J. Teeters.
1912-13	Wilber J. Teeters.	Frank H. Freericks.
1913-14	Hugh Craig.	Frank H. Freericks.
1914-15	F. H. Freericks.	R. A. Kuever.
1915-16	F. H. Freericks.	R. A. Kuever.
1916-17	R. A. Kuever.	C. B. Jordan.
1917-18	C. B. Jordan.	W. F. Rudd.
1918-19	W. F. Rudd.	C. A. Dye.
1919-20	C. A. Dye.	Edward Spease.
1920-21	Edward Spease.	W. H. Zeigler.

Section on Practical Pharmacy and Dispensing.

	Chairman.	*Secretary.*
1900-01	*H. P. Hynson.*	F. W. E. Stedem.
1901-02	F. W. E. Stedem.	William Kaemmerer.
1902-03	Geo. M. Beringer.	*William H. Burke.*
1903-04	*William H. Burke.*	E. A. Ruddiman.
1904-05	Charles A. Rapelye.	Wm. C. Kirchgessner.

Past and Present Officers of the Sections (*Concluded*)

	Chairman.	*Secretary.*
1905-06	*Wm. C. Alpers.*	H. A. Brown Dunning.
1906-07	H. A. Brown Dunning.	*Joseph Weinstein.*
1907-08	*Franklin M. Apple.*	*Joseph Weinstein.*
1908-09	Leonard A. Seltzer.	E. Fullerton Cook.
1909-10	Otto Raubenheimer.	Erich H. Ladish.
1910-11	Louis Saalbach.	P. Henry Utech.
1911-12	P. Henry Utech.	J. Leon Lascoff.
1912-13	J. Leon Lascoff.	F. W. Nitardy.
1913-14	F. W. Nitardy.	Cornelius Osseward.
1914-15	Cornelius Osseward.	I. A. Becker.
1915-16	*Joseph Weinstein.*	H. B. SeCheverell.
1916-17	W. H. Glover.	David Stolz.
1917-18	Josiah C. Peacock.	R. W. Terry.
1918-19	R. W. Terry.	Edward Davy.
1919-20	E. A. Ruddiman.	Ivor Griffith.
1920-21	Ivor Griffith.	H. M. Faser.

Section on Historical Pharmacy.

	Chairman.	*Secretary.*
1904-05	*Albert E. Ebert.*	Caswell A. Mayo.
1905-06	John F. Hancock.	*C. S. N. Hallberg.*
1906-07	*Ewen McIntyre.*	Eugene G. Eberle.
1907-08	Edward V. Howell.	Eugene G. Eberle.
1908-09	*John B. Bond.*	Eugene G. Eberle.
1909-10	Eugene G. Eberle.	*John A. Dunn.*
1910-11	Joseph L. Lemberger.	Otto Raubenheimer.
1911-12	Otto Raubenheimer.	Caswell A. Mayo.
1912-13	John G. Godding.	*Frederick T. Gordon.*
1913-14	*Wm. C. Alpers.*	*Frederick T. Gordon.*
1914-15	*Frederick T. Gordon.*	A. H. Clark.
1915-16	*Charles Holzhauer.*	G. G. Marshall.
1916-17	W. L. DuBois.	L. E. Sayre.
1917-18	L. E. Sayre.	Hugo Kantrowitz.
1918-19	Hugo Kantrowitz.	W. O. Richtmann.
1919-20	W. O. Richtmann.	Curt P. Wimmer.
1920-21	Curt P. Wimmer.	*A. W. Linton.*

Section on Pharmacopoeias and Formularies.

	Chairman.	*Secretary.*
1912-13	L. D. Havenhill.	E. Fullerton Cook.
1913-14	E. Fullerton Cook.	R. H. Needham.

Women's Section.

	Chairman.	*Secretary.*
1912-14	Mrs. John G. Godding.	Miss Anna G. Bagley.
1914-15	Mrs. John Culley.	Miss Anna G. Bagley.
1915-16	Mrs. G. D. Timmons.	Miss Anna G. Bagley.
1916-17	Mrs. E. A. Ruddiman.	Mrs. Jean McKee Kenaston.
1917-18	Miss Zada Cooper.	Mrs. Jean McKee Kenaston.
1918-19	Miss Anna G. Bagley.	Mrs. Jean McKee Kenaston.
1919-20	Mrs. F. J. Wulling.	Mrs. Jean McKee Kenaston.
1920-21	Mrs. Lewis C. Hopp.	Miss Genevieve Simms.

OFFICERS OF THE COUNCIL SINCE ITS FIRST ORGANIZATION.

	Chairman.	*Vice-Chairman.*	*Secretary.*
1880-81	*Jos P. Remington.*	Joseph Roberts.	*George W. Kennedy.*
1881-83	" " "	*Wm. J. M. Gordon.*	" " "

Officers of the council Since Its First Organization (*Concluded*).

	Chairman.	*Vice-Chairman.*	*Secretary.*
1883-84	*Jos. P. Remington.*	*C. Lewis Diehl.*	*George W. Kennedy.*
1884-85	" " "	*John A. Dadd.*	" " "
1885-86	" " "	*C. Lewis Diehl.*	" " "
1886-87	*Wm. S. Thompson.*	*H. J. Menninger.*	" " "
1887-88	Wm. H. Rogers.	*Karl Simmons.*	" " "
1888-89	*Jas. M. Good.*	*Emlen Painter.*	" " "
1889-90	" " "	*Wm. S. Thompson.*	" " "
1890-92	" " "	*Wm. S. Thompson.*	" " "
1892-94	" " "	*H. M. Whitney.*	" " "
1894-95	*Wm. S. Thompson.*	" " "	" " "
1895-96	" " "	*Wm. C. Alpers.*	" " "
1896-1901	" " "	*Jas. M. Good.*	" " "
1901-02	*A. B. Prescott.*	*Chas. E. Dohme.*	" " "
1902-03	James H. Beal.	Lewis C. Hopp.	Henry M. Whelpley.
1903-04	" " "	*Leo Eliel.*	" " "
1904-05	" " "	Jos. L. Lemberger.	" " "
1905-06	" " "	*Wm. C. Alpers.*	" " "
1906-08	" " "	*Albert M. Rochrig.*	" " "
1908-09	*Jos. P. Remington.*	*Wm. S. Searby.*	Joseph W. England.
1909-10	Fabius C. Godbold.	Julius A. Koch.	" " "
1910-11	James H. Beal.	Henry H. Rusby.	" " "
1911-12	Eugene G. Eberle.	*James M. Good.*	" " "
1912-13	" " "	Fabius C. Godbold.	" " "
1913-16	" " "	J. G. Godding.	" " "
1916-19	Lewis C. Hopp.	S. L. Hilton.	" " "
1919-20	" " "	Charles H. LaWall.	" " "
1920-21	Charles H. LaWall.	Charles E. Caspari.	A. G. DuMez.

Officers of the House of Delegates Since Its First Organization.

	Chairman.	*First Vice-Chairman.*	*Second Vice-Chairman.*	*Secretary.*
1912-13	W. C. Anderson.	C. M. Snow.	W. S. Richardson.	Clarissa M. Roehr.
1913-14	C. M. Snow.	W. S. Richardson.	O. F. Claus.	R. A. Kuever.
1914-15	W. S. Richardson.	C. B. Jordan.	H. M. Faser.	*Joseph Weinstein.*
1915-16	*H. P. Hynson.*	F. W. Nitardy.	O. F. Claus.	Jeannot Hostmann.
1916-17	J. H. Beal.	S. C. Henry.	" " "	" "
1917-18	S. C. Henry.	O. F. Claus.	S. L. Hilton.	" "
1918-19	O. F. Claus.	S. L. Hilton.	E. F. Kelly.	" "
1919-20	S. L. Hilton.	E. F. Kelly.	E. L. Newcomb.	" "
1920-21	E. F. Kelly.	J. G. Beard.	Adam Wirth.	" "

CONSTITUTION AND BY-LAWS

OF THE

American Pharmaceutical Association

(Revised to March 1, 1922, inclusive.)

CONSTITUTION

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market by preventing the importation of inferior, adulterated, or deteriorated drugs and by detecting and exposing home adulterations.

2. To encourage such proper relations among Druggists, Pharmacists, Physicians and the people at large, as may promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing, and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a General Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom shall be elected annually; also an Honorary President and a Local Secretary, to be elected by the council. They shall hold office until their successors are elected and qualified or have been installed.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated, to the Association.

may be invested by the Treasurer in United States Government, State, Municipal, County or other securities acceptable as security for postal savings deposits, the interest of which for any current year only may be used by the Association for its expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be printed in the JOURNAL at least thirty days prior to the annual meeting, shall be read at the first general session of the annual meeting, and shall be balloted upon at a subsequent general session, when, upon receiving the affirmative votes of two-thirds of the members present, it shall become a part of the Constitution. Any proposition to amend the Constitution for the purpose of permitting the expenditure of the permanent invested funds of the Association, shall require a majority of seven-eighths for its passage.

BY-LAWS

(Revised to March 1, 1922, inclusive.)

CHAPTER I.

Of the Election of Officers.

ARTICLE I. A Nominating Committee shall be annually chosen, whose duty it shall be annually, at the meeting, to select candidates for the offices of President, three Vice-Presidents and three members of the Council.

ARTICLE II. The Nominating Committee shall submit the names of three persons as candidates for each of the Offices of President, First Vice-President, Second Vice-President, Third Vice-President and three members of the Council. These names are to be submitted by the General Secretary by mail to every member of the Association within three months after he receives them, together with a request that the member indicate his preference on a ballot enclosed for that purpose, and return the same by mail within one month after its receipt.

ARTICLE III. The ballots received as indicated in the preceding article are to be sent by the General Secretary to a Board of Canvassers, composed of three members to be appointed by the President, who shall count as votes in the annual election only the votes of those members whose dues have been paid for the current year, and who in turn shall certify to the General Secretary the result of the election, after which the latter shall be published in the JOURNAL of the Association.

ARTICLE IV. The officers thus elected by a plurality of the votes cast shall be installed at the final general session of the next annual meeting.

ARTICLE V. The Honorary President, Reporter on the Progress of Pharmacy, the Treasurer and the General Secretary, shall be elected annually by the Council.

CHAPTER II.

Of the President and Vice-Presidents.

Article I. The president shall preside at all general sessions of the Association, except those of the special Sections, as hereinafter provided. In the event of his absence or inability to serve, one of the Vice-Presidents, or in the absence of all, a President *pro tempore,* shall perform the duties of the President.

Article II. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore.*

Article III. At the sessions the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports and communications, and order the vote upon all proper questions at the proper time.

Article IV. In all balloting and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal, and in case of such equal division, the motion is lost.

Article V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality and impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in case where he prefers to submit the matter to the members; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

Article VI. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

Article VII. He shall appoint all committees not provided for in the By-Laws or otherwise directed by the Association. He shall announce the names of the appointees on such committees, as far as possible, at the time of his installation or within thirty days thereafter.

Article VIII. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

Article IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific or other questions as may to him seem suitable to the occasion.

CHAPTER III.

Of the General Secretary.

Article I. The General Secretary shall be elected annually and shall receive from the Treasurer an annual salary not to exceed $1,200, and the amount of his expenses incident to the meeting, in addition to his salary. He

shall give bond for the proper disposition of the funds of the Association which may come into his hands, in such amount as may be prescribed by the Council.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the general session, and carefully preserve, on file, all reports, essays and papers of every description presented to the association, and shall be charged with the necessary foreign and scientific correspondence, and with the distribution of the Report on the Progress of Pharmacy under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose, shall call and record the ayes and nays, whenever they are required to be called, shall notify all officers of the association and the chairmen of all standing and special committees of their election or appointment, giving each a statement of his duties and such other information as may be of service and shall perform such other duties as are prescribed in the Constitution and By-Laws or which may be assigned to him by the Council or the Association.

CHAPTER IV.

Of the Local Secretary.

ARTICLE I. The Local Secretary shall assist the General Secretary in his duties; shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairman of the several committees, and with other members in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers and apparatus destined for use or exhibition at the meetings.

ARTICLE II. An exhibition of objects interesting to pharmacists may be held each year, should the Council so determine, under the direction of the Local Secretary and the Section on Commercial Interests.

CHAPTER V.

Of the Treasurer.

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the General Secretary, accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual dues for six months.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary not to exceed $1000, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds for

the amount of $15,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by a Trust Company acceptable to the Council.

CHAPTER VI.

Of the Reporter on the Progress of Pharmacy.

Article I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual salary not to exceed $1,200.

Article II. All journals and volumes received in exchange for the Report on the Progress of Pharmacy by the General Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the General Secretary for preservation.

Article III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry and Materia Medica, and the collateral branches of knowledge; together with such data as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad. He shall also prepare an index or brief extract of current pharmaceutical and chemical literature for publication in the Journal of the Association.

Article IV. The Report on the Progress of Pharmacy shall be edited, published and distributed under rules and regulations approved by the Council. It shall be issued as a yearly volume, covering each fiscal year of the Association.

Article V. In case of the illness or other inability of the Reporter to carry on the work of the report, the General Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VII.

Of the Council.

Article I. The business of the Association which is not of a scientific character shall be in charge of a Council, which is empowered to transact business for the Association between the times of meeting, to reduce any appropriations that have been made, whenever in their judgment the current receipts are not sufficient to allow the expenditure, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association.

Any member of the Association may attend the meetings of the Council, and may, by permission of the presiding officer, be permitted to speak on any subject under discussion.

Article II. The Council shall consist of *ex-officio* members; one member, from each local branch of this Association and nine other members,

selected from such members as have had at least three years' membership in this Association, shall be elected by ballot by the Association in the following order: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the place of those whose terms will then expire, to serve for the term of three years.

Article III. The President, Honorary President, Vice-Presidents, General Secretary, Local Secretary, Treasurer, Reporter on the Progress of Pharmacy, Editor-in-chief of the Journal, the Chairmen of the Sections of the Association, the Secretary of the Council, and the Historian of the Association shall be *ex-officio* members of the Council.

Article IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

Article V. The officers of the Council shall consist of a Chairman, Vice-Chairman and a Secretary, to be elected by ballot annually by the Council.

Article VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

Article VII. There shall be elected annually by ballot, by the Council, two standing committees of the Council—a Committee on Publication and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

Whenever deemed advisable by the Council, it shall after the publication of each edition of the National Formulary appoint a committee of fifteen members from the general membership of the Association, which committee shall have charge of the revision of the Formulary. This committee shall report annually, or as often as required, to the Council, and shall continue to serve until the edition for which it was appointed has been completed. Vacancies occurring in this committee shall be filled by the Council as quickly as is expedient.

Article VIII. The Council shall have charge of the revision of the roll of members, and the editing, publication and distribution of all the publications of the Association.

The Secretary of the Council shall submit to the Council the names of the candidates who have been proposed for membership, when a majority vote shall be sufficient to elect them.

Article IX. The Council shall furnish to each member of the Association, not in arrears, one copy of the Report on the Progress of Pharmacy, which publication shall contain, in addition to the report, a list of the officers and committees, prefatory matter, constitution and by-laws, general rules, roll

of members, list of members, and such other matter as may be deemed desirable by the Council. It shall fix, also, the price for which copies of the Report may be sold.

ARTICLE X. The Council shall issue a monthly journal, beginning in January, 1912, and thereafter, under rules and regulations to be adopted by the Council, and shall furnish copies of such publication to each member of the Association not in arrears for subscription. The publication shall contain editorials, original articles, the proceedings of the annual meetings, of the Council, and of the branches, and such other matter as may be deemed desirable by the Council.

CHAPTER VIII.

Of Membership.

ARTICLE I. Every pharmacist and druggist of good moral and professional standing whether in business on his own account, retired from business, or employed by another, teachers of Pharmacy, Chemistry and Botany who may be especially interested in Pharmacy and Materia Medica, editors and publishers of pharmaceutical journals and other persons interested in the progress of the science and art of pharmacy, who, after duly considering the objects of the Association and the obligations of the Constitution and By-Laws, subscribe to them, are eligible to membership; provided that any person whose name has been dropped from the roll of members for non-payment of dues may be re-admitted after having again made application in regular form, the application being accompanied by the usual fee; or he may be re-admitted, without such application, on payment of all back dues; in the latter case his membership shall date from the time when he first joined the Association, as previously printed in the Roll of Members, and notice of such action shall be inserted in the addendum to the Treasurer's report.

ARTICLE II. Every application for membership shall require the endorsement of two members of the Association in good standing, and each applicant must receive the affirmative vote of a majority of the members of the Council for election, after which his membership shall be completed by his signing the Constitution and By-Laws and paying the annual dues for the current year. Any newly elected member, upon the payment of annual dues for the year in which he is elected, shall be entitled to the annual volume of the Report on the Progress of Pharmacy and such other publications of the Association as are distributed to its members free of charge during the year. Any application for membership made during the fiscal year (the calendar year shall be the fiscal year of the Association) shall apply to the current fiscal year; except between June and January, when, if desired, it can be made to apply to the next fiscal year, if so stated on the application. The publications will be sent for the fiscal year in which the dues and subscription are credited except to those who have resigned or have been dropped from the rolls for the non-payment of dues prior to the issuance of any such publication.

The price for the Report on the Progress of Pharmacy to non-members shall be fixed by the Council. The subscription price for the JOURNAL of the

Association shall be four dollars per annum to members and non-members alike. The subscription of the JOURNAL must be separate and distinct from the annual dues, although both may be paid at one and the same time.

ARTICLE III. Every member shall pay *in advance* to the Treasurer the sum of four dollars as anuual dues, and by neglecting to pay said contribution for *six successive months,* may be dropped from the roll of members. If the annual dues (four dollars) and the annual subscription to the JOURNAL (four dollars) be paid at one and the same time, a reduction of three dollars shall be allowed.

ARTICLE IV. Any member of the Association who shall pay to the Treasurer the sum of $100.00 during the first year of his connection therewith, and also any member not in arrears, who after ten years shall pay the sum of $75.00, or after fifteen years the sum of $50.00, or after twenty years the sum of $40.00, or after twenty-five years the sum of $25.00, and any member who may have paid annual dues for thirty-seven consecutive years, shall become a life-member, and shall be exempt from all future annual contributions.

ARTICLE V. Resignation of membership shall be made in writing to the General Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE VI. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at a general session.

ARTICLE VII. Pharmacists, chemists, and other scientific men who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office or vote at the meetings.

CHAPTER IX.

Of Meetings and Sections.

ARTICLE I. The meetings shall be held annually: Provided that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, the following Sections are provided:

1. Scientific Section, with four subdivisions: (*a*) Chemistry, (*b*) Botany and Pharmacognosy, (*c*) Biologic Assays, (*d*) Bacteriology.
2. Section on Commercial Interests.
3. Section on Practical Pharmacy and Dispensing.
4. Section on Pharmaceutical Legislation and Education.
5. Section on Historical Pharmacy.
6. Women's Section.

Upon the approval of the Council additional Sections may be organized from time to time as necessitated. Each Section, through its officers, shall solicit papers and propose suitable subjects for discussion at the annual meeting, arrange the business of the Section in advance, and perform such duties as may be referred to it. It shall make reports to the Council or Association if requested. The conduct of the work of each Section shall be under by-laws, rules and regulations approved by the Council. All committees proposed or appointed by the Sections shall be subject to the approval of the Council.

Article III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

Article IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read the minutes of the Council in full or in abstract, act on the report of Council or membership, and receive propositions for amendments to the By-Laws.

Article V. A Chairman and Secretary shall be elected by ballot by each Section (except the Scientific Section which elects its officers in accord with the by-laws of said Scientific Section) to serve at the sessions of said Section. The minutes of each session, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the General Secretary for publication and safe-keeping.

Article VI. The Chairman of each Section (except the Scientific Section whose officers act in accord with the by-laws of said Scientific Section) shall preside at each of its sessions, and shall prepare a short address treating upon the subjects connected with his section, to be read before the Section at the annual meeting.

Article VII. The officers of the Section on Commercial Interests shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting; shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of the Association shall present a report of the action of the State Associations upon the subject proposed.

Article VIII. The Chairman of the Section on Practical Pharmacy and Dispensing shall appoint a committee of three on pharmacopoeias and formularies to co-operate in the work of the Section by obtaining papers on the subjects of pharmacopoeias and formularies and discussions thereon. The officers shall arrange in advance of the meeting the business to come before the Section.

Article IX. The officers of the Section on Pharmaceutical Legislation and Education shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines; shall report at each stated meeting of the Association what legislation on pharmaceutical subjects has occurred during the year;

shall arrange the business of the Section in advance of its sessions, propose suitable subjects for discussion, and shall attend to such duties as may be delegated to them by the Section; shall propose each year a subject for discussion at the meetings of the State Associations, and, at the following annual meeting of this Association, shall present a report to the section from the State Associations upon the subject proposed.

ARTICLE X. The officers of the Section on Historical Pharmacy shall arrange the business of the Section and shall present annually matters of special historical interest in pharmacy; and shall also secure the collection of letters, papers, etc., written by members of the Association, which when so collected shall remain in the custody of the Section and be available for reference to any one interested.

ARTICLE XI. The Women's Section shall consist of women who are regular members in good standing in the American Pharmaceutical Association, and the women of the families of regular members in good standing, united for the purpose of promoting the aims of the American Pharmaceutical Association and for advancing the interests of women engaged in pharmaceutical pursuits.

ARTICLE XII. The order of business at the first session of each annual meeting shall be as follows:

1. Promptly at the time named in the notice issued for the meeting, the President, or, in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore,* shall officiate.

2. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore,* who shall perform the duties of the General Secretary until his arrival.

3. Nineteen members shall constitute a quorum for the transaction of business.

4. The President's Address may then be read, after which the Council shall report the list of properly accredited delegates.

5. Reports of Committees shall be presented, read by their titles, synopsis, or in full, and laid on the table for future consideration.

6. An abstract of the minutes of the Council shall be read at the annual meeting of the Association, and the acts of the Council shall be approved, amended or revised so as to be acceptable to the Association. At any general session, a member may request further information upon any matter reported on by the Council.

7. The President shall call the roll of States, the Territories, District of Columbia, and the Provinces of Canada, requesting the members present from each State or Territory to appoint two members, the persons so selected to act as a Committee to nominate officers for the Association and members of the Council for the ensuing three years; in addition to which the President shall appoint five members from the Association-at-large to act with the Committee. Delegates who are not members must complete their membership before they are eligible to serve on the Nominating Committee.

8. Incidental business.

Article XIII. The order of business at the second general session at each annual meeting shall be as follows:

1. The President shall call the Association to order.

2. The Secretary shall read the minutes of the preceding session, which may be amended, if necessary, and shall then be approved.

3. The report of the Committee on Nomination shall be read.

4. Reading of the Minutes of the Council.

5. Reading of the Reports of the Treasurer and General Secretary.

6. Reports of Standing Committees shall be read.

7. Reports of Special Committees shall be read.

8. Incidental business.

9. Adjournment subject to the call of the President.

Article XIV. The order of business for the sessions of the Sections shall be determined by each Section for itself.

Article XV. No money shall be appropriated from the Treasury by any of the Sections.

Article XVI. Any person desiring to submit a paper to the Association shall present to the Chairman of the particular Section to which it refers at least ten days prior to the meeting, an abstract of said paper, indicative of its contents, and consisting of not less than fifty nor more than two hundred words.

This abstract shall be printed as a part of the program. The paper itself must be submitted to the officers of the Section previous to the first session. Not more than ten minutes shall be allowed for the presentation of any paper, unless by unanimous consent of the Section. This does not apply to the Scientific Section, which handles its papers in accord with the by-laws of said Scientific Section.

All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publications than those of the Association, except by the consent of the Committee on Publication.

Article XVII. At the last general session of the Association the newly elected officers of the Association shall take their respective places.

Article XVIII. The Council may arrange for such social sessions, to be held after the adjournment of the last general session, as it may deem expedient, but no business of the Association can be transacted at these social sessions.

CHAPTER X.

Of Committees.

Article I. There shall be appointed or elected standing committees as follows: A Committee on United States Pharmacopoeia, a Committee on Transportation, and a Committee on Research, each to consist of ten members; a

Committee on Pharmaceutical Syllabus, to consist of seven members; a Committee on Time and Place of Meeting; a Committee on Ebert Prize; and a Committee on General Prizes, each to consist of three members; and a Committee on Program.

Article II. The Committee on the Ebert Prize, which shall be appointed by the Chairman of the Scientific Section, shall at the next annual meeting after the one at which essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all respects it shall be governed by the stipulations expressed by the donor.

Article III. The Committee on General Prizes, which shall be appointed by the President, shall, at the next annual meeting after the one at which the papers are presented, determine which, if any of them, are worthy of prizes, and decide upon the relative merits of such papers are are deemed worthy.

Article IV. The Committee on the United States Pharmacopoeia shall be appointed by the President of the Association as follows: One member to be appointed for ten years, and one for nine, eight, seven, six, five, four, three, two and one years, respectively, each vacancy occurring by expiration of term to be filled by a new appointment for ten years. The Committee shall elect its own Chairman annually. It shall collect statistics regarding the frequency with which official and non-official remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and requirements of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopoeia. It shall also note errors of any kind found in the U. S. Pharmacopoeia as to facilitate and aid the work of the National Committee of Revision of the U. S. P.

Article V. The Committee on Transportation, which shall be elected by the Council, shall consist of one member each from the cities of Boston, New York, Chicago, St. Louis, Cincinnati, New Orleans, Atlanta, St. Paul, or Minneapolis, Denver, Baltimore, Cleveland and San Francisco, and in conjunction with the General Secretary and the Local Secretary, who shall be members of the Committee, shall arrange for transportation from the different sections of the United States and Canada to the place of meeting and return. The Council shall annually elect the Chairman of this Committee.

Article VI. The Committee on Pharmaceutical Syllabus shall be appointed by the president of the Association as follows: One member shall be appointed for seven years, and one for six, five, four, three, two and one years, respectively, each vacancy occurring from expiration of term shall be filled for a term of seven years; other vacancies shall be filled at the annual meetings of the Association for the unexpired terms. This committee shall report to the Association through the Section on Pharmaceutical Legislation and Education, shall be members of the National Committee on Pharmaceutical Syllabus and shall recommend to the Association its proportionate share of the current expenses.

Article VII. The reports of all committees of the Association must be sent to the General Secretary in time for presentation at the first general session of the annual meeting of the Association.

ARTICLE VIII. The Committee on Program shall consist of the Local Secretary, the General Secretary and the Secretary of the Council. It shall be the duty of the Committee to prepare and submit to the Council the program for the annual meeting so that same can be published in the JOURNAL at least two months in advance of the annual meeting.

ARTICLE IX. The Committee on Pharmaceutical Research shall be elected by the Council, two members to serve for a term of five years, two for a term of four years, two for a term of three years, two for a term of two years, two for a term of one year, and after the expiration of the one-year term two members shall be elected annually for a term of five years, the Committee on Pharmaceutical Research shall endeavor to promote research along pharmaceutical lines and shall advise the Council as to the use of the research funds of the Association.

CHAPTER XI.

House of Delegates.

ARTICLE I. There shall be and hereby is created a House of Delegates to have and to exercise such functions as may be hereafter specified by the Association.

CHAPTER XII.

Rules of Order and Debate.

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the assembly and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely: which several motions have precedence in the order named. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the ayes and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

ARTICLE V. On all points of order not covered in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

CHAPTER XIII.

Local Branches.

ARTICLE I. Local branches of this Association may be formed whenever it may appear that fifteen members of this Association in good standing, will participate, provided that no more than one such branch shall be formed in any one state, province, district or territory unless such branches shall be formed at a point distant one hundred miles or more from any branch already established in the same state, province, district or territory.

ARTICLE II. All active or voting members of local branches must be members of this Association in good standing.

ARTICLE III. The objects and aims of local branches of this Association, shall be the same as set forth in ARTICLE I of the Constitution of this body, and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it. And no local branch shall enact any article of constitution or by-law to conflict with the Constitution or By-Laws of this Association.

ARTICLE IV. Each local branch having twenty-five active or voting members shall be entitled to elect one member every three years, who shall become and continue a member of the Council of this Association for that time, subject to the provisions of ARTICLE V.

ARTICLE V. If within any one calendar year any local branch shall fail to hold at least three stated meetings, the proceedings of which are reported in the JOURNAL, the BRANCH shall be deemed to be suspended and the membership of such branch in the Council shall terminate.

CHAPTER XIV.

Amendments.

ARTICLE I. Every proposition to alter or amend these By-laws shall be submitted in writing at a general session, and may be balloted for at any subsequent general session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-laws.

BY-LAWS OF THE COUNCIL

(Revised to March 1, 1922, inclusive.)

CHAPTER I.

Of the Election of Officers.

ARTICLE I. The officers of the Council shall consist of a Chairman, a Vice-Chairman and a Secretary, who shall be elected by ballot by the Council, to serve one year.

Article II. They shall be elected and shall assume the duties of their respective offices after the election of new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice-Chairman.

Article I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice-Chairman, or, in the absence of both, a Chairman *pro tempore,* shall perform the duties of the Chairman.

Article II. The Chairman of the Council shall confer with the Chairmen of the various special and standing committees of the Association, during its sessions in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

Article I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary not to exceed $300, and the amount of his expenses incident to the meeting, in addition to his salary.

Article II. He shall read all the papers handed him by the Chairman for that purpose; shall call and record the ayes and nays whenever they are required to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting of the Council.

CHAPTER IV.

Of Committee on Publication.

Article I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council, together with the Editor-in-chief of the Journal, the General Secretary, the Reporter on the Progress of Pharmacy and the Treasurer as *ex-officio* members. The Council shall elect the Chairman.

Article II. The Committee on Publication shall have charge of the editing, publication and distribution of the Report on the Progress of Pharmacy and the Journal of the Association, and such other publications as may be issued, under rules and regulations to be approved by the Council.

Article III. The Editor-in-chief of the Journal shall be elected annually and shall receive from the Treasurer for his services such compensation as the Council may direct.

ARTICLE IV. The Editor-in-chief of the JOURNAL shall have charge of the editing, publication and distribution of the JOURNAL subject to the rules and regulations of the Committee on Publication.

ARTICLE V. In case of illness or other inability of the Editor-in-chief to carry on the work of the JOURNAL, the Committee on Publication shall be authorized to make the best arrangements possible to continue the work.

CHAPTER V.

Of Committee on Finance.

ARTICLE I. The Finance Committee shall consist of three members and shall each year, previous to January 1, present to the Council for its consideration a list of appropriations to cover the various expenditures of the ensuing fiscal year. No payment shall be made in excess of any of the said appropriations, except by a special vote of the Council. Provided, however, that the Treasurer is authorized to transfer from one appropriation account to another such amount as may be needed at any time, the amount of any such transfer not to exceed the sum of fifty ($50.00) dollars.

All motions and resolutions involving the expenditure of any sum in excess of $25.00 shall have the approval of the Finance Committee before being acted upon by the Council.

All appropriations made for any fiscal year shall lapse at the end of the said fiscal year. Provided, however, that accounts properly chargeable against any of said appropriations prior to their expiration, but not received by the General Secretary until after the end of the fiscal year, may be paid from such appropriation, in case the warrant for such payment be drawn not later than twenty days after the expiration of said fiscal year.

CHAPTER VI.

Of Executive Committee.

ARTICLE I. The Executive Committee shall consist of three members of the Council holding no other office, to be elected annually by the Council, and the President, General Secretary, Treasurer, Chairman of the Council and Secretary of the Council. The Chairman of the Council shall be the Chairman of the Committee and the Secretary of the Council the Secretary of the Committee.

ARTICLE II. The Executive Committee shall be the executive body of the Council. It shall make recommendations to the Council for the good of the Association and shall have the power to act for the Council when so directed. The Secretary shall report its actions to the Council. When deemed necessary to the Committee, it shall hold meetings at a convenient place between the times of annual meetings, and the traveling expenses of its members shall be paid.

CHAPTER VII.

Of Committee on Centennial Fund.

Article I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and the General Secretary. It shall receive applications in writing from members for grants from the interest derived from the Centennial Fund, the application to be accompanied by a statement of the investigation to be made, and of the amount and cost of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

Article II. The Committee shall consider these applications, and at as early a date as possible shall report to the Council an outline of the proposed investigations, together with such recommendations of grants from the available funds as it may deem proper.

Article III. The Council shall decide upon these recommendations, and in case the grants be approved, the Chairman of the Council shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VIII.

Of Sessions.

Article I. The Council shall meet previous to the assembling of the Association, and at such other times as it may determine, or at the call of the Chairman.

Article II. On the written application of three members to the Chairman of the Council, a special session shall be called.

Article III. Nine members of the Council shall constitute a quorum.

Article IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman and the Secretary.
2. Election of the Standing Committees of Council, as follows:
   a. Committee on Finance, three members.
   b. Committee on Publication, five members.
   c. Committee on Centennial Fund, three members.
3. Unfinished and deferred business from the last Council, or such business as is especially referred to the Council from the Association.
4. Reading the names of candidates for membership.
5. Reading of reports and appointment of committees.
6. New business.
7. Adjournment—and before the final adjournment, the minutes of the last session of the Council shall be read and approved.

CHAPTER IX.

Miscellaneous.

Article I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

Article II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or negative vote, the Chairman of the Council or the Chairman of the Committee may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if members had been personally present, a majority of the votes cast being considered sufficient to decide a question. The ayes and nays of such votes taken by the Council shall be entered upon the minutes.

Article III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at the next session of the Council, when, upon receiving the vote of three-fourths of the members present, it shall become a part of these By-Laws.

BY-LAWS OF THE SCIENTIFIC SECTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to March 1, 1922, inclusive.)

SECTION I.

NAME.

Article I. This organization shall be known as the Scientific Section of the American Pharmaceutical Association.

SECTION II.

MEMBERSHIP.

Article I. All members of the American Pharmaceutical Association in good standing, who express a desire to do so, by registering their names with the Secretary of the Section, shall become members of the Section.

SECTION III.

OFFICERS.

Article I. The officers of the Section shall be a Chairman, a First Vice-Chairman, a Second Vice-Chairman and a Secretary, selected from members of the Section.

SECTION IV.

ELECTION OF OFFICERS.

Article I. The Chairman of the Section shall at the first session appoint a committee of three, who shall report to the Section at the same session two names for each office. At the last session of the Section these names shall be

balloted upon, and the one receiving a majority for that particular office shall be declared elected. These shall then be installed and shall hold office for one year or until their successors are duly elected.

Article II. Officers may be re-elected, but with the exception of the Secretary shall not hold the same office for more than two consecutive years.

Article III. The Council of the Association shall fill any vacancies that may occur among the officers.

SECTION V.

DUTIES OF OFFICERS.

Chairman and Vice-Chairmen.

Article I. It shall be the duty of the Chairman to represent the Section in the Council of the Association, to preside at the annual meetings of the Section, appoint all committees of the Section and fill any vacancies when occurring in these committees. He may present an annual address on any subject of interest to the Section that he may deem of sufficient importance.

Article II. In the absence of the Chairman, the First Vice-Chairman shall preside and exercise all the functions of the Chairman.

Article III. In the absence of the Chairman and the First Vice-Chairman the second Vice-Chairman shall preside and exercise all the functions of the Chairman.

Article IV. In the absence of all three of these officers the Section shall elect a temporary Chairman.

Secretary.

Article V. The Secretary shall keep a record of the proceedings of the Section, shall send to the members such notice as the business of the Section may require, shall transmit to the General Secretary the names of the officers and committees elected or appointed, and notify the General Secretary of any changes in the personnel of the officers or committees of the Section, and shall furnish the General Secretary a report of the sessions held at the annual meeting. The Secretary, at least two months in advance, shall write to each member of this Section, giving notice of the latest date upon which papers can be accepted for the program.

Article VI. The Secretary shall be custodian of the records and documents of the Section, as well as of all funds, and shall make all disbursements subject to the approval of the Chairman.

Article VII. The Secretary shall arrange the program for the annual meeting, and furnish the editor of the Journal of the Association the program for inclusion in the number just preceding the annual meeting.

Article VIII. The Secretary shall at each annual meeting present a brief report to the Association of the condition within the Section.

ARTICLE IX. In case the Secretary is unable to attend the annual meeting, he shall notify the Council to that effect and the Council shall then appoint a temporory Secretary.

SECTION VI.

MEETINGS.

ARTICLE I. At least three sessions of the Section shall be held at each annual meeting of the Association. Additional sessions may be held at any time during the meeting when the officers of the Section may see fit, and by consent of the Council; provided, however, that these sessions be so arranged that they conflict as little as possible with sessions of other Sections, and that no session be held simultaneously with the final session of the Association.

SECTION VII.

ORDER OF BUSINESS.

ARTICLE I. The order of business at the first session shall be as follows: (1) Chairman's Address; (2) Secretary's Report; (3) Reports of Standing Committees and Committees of the Association which report to this Section; (4) Nomination of Officers; (5) Miscellaneous Business; (6) Reading of Papers.

ARTICLE II. The time of the other sessions shall be taken up with the reading of papers, excepting as provided for in Section IV (Election of Officers) and Section X (Amendments), or to hear the reports of special committees.

ARTICLE III. Provided, however, that discussion of papers may be interrupted at any time to consider matters referred to the Section by the Association in general session or by the Council.

ARTICLE IV. This regular order of business may be suspended at any time during a session, for that particular session, by a three-fourths vote of those present.

SECTION VIII.

EXPENSES.

ARTICLE I. The expense of printing, postage and stationery shall be paid from the Association treasury, but in no case to exceed $25.00 for one year.

ARTICLE II. Appropriations for expenses other than those named here must be procured by authority of Council through the Chairman of the Section.

SECTION IX.

PAPERS.

ARTICLE I. Original papers on any subject of scientific interest may be accepted at the discretion of the officers of the Section.

Article II. The complete title and a brief extract of all papers, not to exceed 250 words, must be in the hands of the Secretary in time for inclusion in the program which is published, as provided in Section V, Article 7.

Article III. Fifteen minutes shall be allowed for the reading of a paper. If the paper is too lengthy to be read in detail within this space of time, it shall be presented in abstract.

Article IV. Each speaker in the discussion of a paper shall be allowed five minutes, but all such discussion shall be confined to the paper or subject under consideration at that time.

Article V. The time allowed for presenting a paper or discussion may be extended by unanimous consent of those present.

Article VI. All papers and reports presented to the Section become the property of the Association and shall be forwarded to the Editor of the Journal immediately following the annual meeting by the Secretary of the Section.

SECTION X.

AMENDMENTS.

Article I. These by-laws may be amended at the final session of any annual meeting by a two-thirds vote of those present, provided notice of such amendment is given together with the text thereof at any previous session held at that meeting. Amendments must finally be accepted by the Council as not in conflict with the Constitution and By-Laws of the Association.

SECTION XI.

MISCELLANEOUS.

Article I. Questions not specifically covered by these by-laws shall always be decided in accord with the Constitution and By-Laws of the Association.

BY-LAWS OF THE HOUSE OF DELEGATES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to March 1, 1922, inclusive.)

CHAPTER I.

Article I. Functions. The House of Delegates shall have and exercise the following functions:

A. To receive and consider the reports of delegates from the bodies which they represent in the House of Delegates and to receive the greetings of fraternal delegates to the Association from other organizations or from departments of the United States Government.

B. Consider and report upon such resolutions and upon such other subjects as may be referred to the House of Delegates by the Council or by the Association in general session, or by the various Sections.

C. Make a final report of the business transacted by the House of Delegates to the Association not later than the last general session at each annual meeting.

D. It shall have the authority to adopt all rules and regulations necessary for the proper conduct of its business and not inconsistent with the Constitution and By-Laws of the Association and the Council.

CHAPTER II.

ARTICLE I. Representation. The membership of the House of Delegates shall consist of three regularly appointed delegates from each state pharmaceutical association, from the District of Columbia Association, and from similar associations in Porto Rico, the Philippines and any other foreign American state, provided, however, that the delegates so appointed will have the privilege of the floor, but not vote, unless they be members of the American Pharmaceutical Association.

Delegates from all other bodies or organizations shall have the privilege of the floor but shall not have the right to vote.

ARTICLE II. Term of Service. The elected or appointed delegates shall hold office for one year, or until the credentials of their successors shall have been approved by the Council.

CHAPTER III.

ARTICLE I. Organization. The first session of the House of Delegates at each annual meeting shall be called to order by the Chairman, or one of the Vice-Chairmen, or the Recording Secretary of the preceding House; or, in the absence of all of these, by the General Secretary of the Association.

ARTICLE II. Voting. Each delegate shall be entitled to one vote. No delegate shall act as proxy of another delegate who has not been seated, nor as delegate for more than one association, organization, or institution.

ARTICLE III. Privileges. Any member of the American Pharmaceutical Association may attend any session of the House of Delegates and shall have the privilege of the floor.

CHAPTER IV.

ARTICLE I. Officers. The officers of the House of Delegates shall consist of a Chairman, two Vice-Chairmen and a Recording Secretary, who shall be elected annually by ballot by the House of Delegates.

ARTICLE II. Duties of Chairman and Vice-Chairmen. The Chairman shall preside at all meetings of the House of Delegates; in his absence, or on account of inability from any cause, the First Vice-Chairman; or, in his absence, the Second Vice-Chairman; or in the absence of the three, a Chairman *pro tempore* shall perform the duties of the Chairman.

Article III. Duties of the Recording Secretary. The Recording Secretary shall keep fair and correct minutes of the proceedings of the meetings and carefully preserve all reports and papers of every description received by the House of Delegates, and deliver the same to the General Secretary of the Association at the annual meeting. The Recording Secretary shall read all papers received for the purpose; shall call and record the ayes and nays whenever they are required to be called; shall notify the Chairman of every special committee of his appointment, giving a list of his colleagues, and stating the business on which the committee is to act, and shall give notice of the time and place of each meeting of the House of Delegates.

Article IV. The General Secretary of the Association shall, in January of each year, send appropriate blank credentials for delegates to the various bodies entitled to representation in the House of Delegates, notify the said associations of the time when the credentials, properly filled out, shall be returned, and on or preceding the first day of the annual convention, shall deliver such credentials to the Recording Secretary. All credentials received after the opening of the convention shall be handed directly to the Recording Secretary.

The General Secretary shall cause all of the proceedings of the House of Delegates annually to be printed in the Journal of the Association, and shall procure a sufficient number of reprints of the same for distribution among the members of the House of Delegates and the officers of the Association. Said reprints shall also contain the by-laws and a list of the members, officers and committees of the House of Delegates.

CHAPTER V.

Article I. Sessions. The House of Delegates shall hold at least one session during the annual meeting of the Association at an hour previously determined by the Executive Committee and such additional sessions as may be necessary for the transaction of its business.

CHAPTER VI.

Article I. The Committee on Resolutions. The Chairman shall appoint a Committee on Resolutions consisting of five members, to which shall be referred all resolutions, and which shall report to the House the results of its deliberation not later than the last session of the House.

Article II. The Chairman, Vice-Chairmen and Recording Secretary shall constitute an Executive Committee to pass upon the credentials of representatives to the House of Delegates, to arrange the program for the annual meeting, and to perform such other duties as are commonly discharged by executive committees, or which may be referred to them by the Association or by the House of Delegates.

Article III. Special Committees. The Chairman shall appoint such special committees as may be directed by the House.

CHAPTER VII.

ARTICLE I. Resolutions. All resolutions shall receive a majority of affirmative votes of those present for adoption.

ARTICLE II. Amendments. Every proposition to amend these by-laws shall be submitted in writing at one session of the House and may be balloted upon at the next session, when upon receiving the affirmative vote of three-fourths of the members present it shall become a part of the by-laws.

CHAPTER VIII.

ORDER OF BUSINESS.

The following shall be the Order of Business:

1. Calling Roll of Delegates whose credentials have been approved by the Executive Committee.
2. Appointment of Committee on Resolutions.
3. Reading of communications from the Association, Sections and Council.
4. Calling Roll of Delegations for reports, resolutions and communications, all of which shall be in writing.
5. Miscellaneous business.
6. Election and Installation of Officers.
7. Adjournment to a certain time.

BY-LAWS OF THE WOMEN'S SECTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to March 1, 1922, inclusive.)

ARTICLE I.

Name and Object.

SECTION 1. This Section shall be known as the Women's Section of the American Pharmaceutical Association.

SEC. 2. The object of this Section shall be to emphasize the right and capability of women to engage in pharmaceutical pursuits as a means of livelihood; to unite the women employed in pharmaceutical pursuits for mutual encouragement and assistance; to labor for the improvement of legislation regulating the registration as pharmacists, of the women employed in the practice of pharmacy in hospitals and other public institutions; to unite the women members of the American Pharmaceutical Association and the women of the families of members of the American Pharmaceutical Association in a Section for social purposes; and to coöperate in the promotion of the general progress of pharmacy and of the American Pharmaceutical Association.

ARTICLE II.

Membership.

Section 1. Members of this Section shall consist of the women who are regular members in good standing of the American Pharmaceutical Association, and the women who are of the families of regular members in good standing of the Association.

ARTICLE III.

Officers.

Section 1. The officers shall consist of a President, three Vice-Presidents, a Secretary-Treasurer, and a Historian, all of whom shall be elected by ballot annually, and shall hold their respective offices for one year and until their successors shall have been elected and qualified. Their duties shall be such as are prescribed in the parliamentary authority of the Section and in these by-laws.

Sec. 2. It shall be the duty of the President to preside at the annual meeting, to appoint all committees not otherwise provided for, to see that the by-laws are observed, and to perform such additional duties as may be delegated to her by the Section or by the Executive Board.

Sec. 3. It shall be the duty of the Vice-Presidents to preside in their order in the absence of the President, and to perform such additional duties as may be imposed from time to time by the Section or by the Executive Board.

Sec. 4. The Secretary shall keep the minutes of the meetings and the records of the Section and of the Executive Board; shall conduct the general correspondence; shall notify all committees of their appointments and of any special duties which may be imposed; and shall also notify officers not present at the time of their election, of their election.

Sec. 5. The duty of the Treasurer shall be to receive and keep an account of the funds of the Section, and pay them out on the order of the Secretary countersigned by the President.

Sec. 6. It shall be the duty of the Historian to record the progress and activities of women engaged in pharmaceutical pursuits in the several states, and to present a report of the matter accumulated at each annual meeting of the Section.

Sec. 7. An Honorary President for the year may be elected at each annual meeting by a vote of two-thirds of the women who are present.

ARTICLE IV.

Executive Board.

Section 1. The Executive Board shall consist of the President and the Secretary *ex-officio*, and three elected members, one of them shall be elected by ballot at each annual meeting to serve for three years.

Sec. 2. It shall be the duty of the Executive Board to direct the affairs of the Section in the interim between the annual meetings, to arrange the program for the annual meetings and to perform such additional duties as may be imposed upon it by the Section. The Board shall have authority to conduct its business by mail. All acts of the Executive Board shall be subject to revision by the Section. It shall be the duty of the Chairman of the Board to assign and supervise the work of the Standing Committees so that the work may be definite and uniform.

ARTICLE V.

Standing Committees.

Section 1. The Committee on Membership and Press, the Outlook Committee, and the Hospital Committee, shall constitute the standing committees of the Section.

Sec. 2. The Committee on Membership and Press shall consist of eleven members of the Section, composed of a Chairman, elected by the Section, and ten active workers, who shall be appointed by the President.

Sec. 3. The Outlook Committee shall consist of nine members of the Section, appointed by the President, whose duty it shall be to investigate and report on the work of the women pharmacists, to investigate the education of women students wishing to take up the study of pharmacy and to coöperate with women's clubs.

Sec. 4. The Hospital Committee shall consist of four members of the Section, appointed by the President, whose duty it shall be to investigate and report on conditions of pharmacists in institutional pharmacy.

Sec. 5. The members of all special committees shall be appointed by the President, unless the Section shall prefer to elect.

ARTICLE VI.

Meetings.

Section 1. The Section shall hold one regular annual meeting during the annual meeting of the American Pharmaceutical Association, and such additional meetings or sessions as the Section shall determine.

Sec. 2. On the first day of the annual meeting the President shall appoint from the members of the Section a nominating committee of five, and not less than four tellers, to count and report the ballots at the annual election. The Nominating Committee shall report on the same day or a succeeding day, as the Section may direct, nominations for all the officers, for the member of the Executive Board, and for Chairman of the Committee on Membership and Press. Additional nominations may be made from the floor. The elections shall be by ballot, unless, where there is but one candidate for an office, it is dispensed with by unanimous consent. The officers elected who are present shall be installed at the close of the annual meeting.

SEC. 3. Special meetings of the Section may be called by the President at her discretion, and shall be called by her upon written request of the Executive Board, or upon the written request of any five members of the Section.

SEC. 4. Seven members shall constitute a quorum at any meeting of the Section.

ARTICLE VII.

Parliamentary Authority.

Except as herein provided, the proceedings of the Section shall be governed by the general rules of parliamentary law as stated in Robert's Rules of Order, Revised.

ARTICLE VIII.

Amendments.

Amendments to these by-laws shall be proposed in writing at one meeting and balloted for upon a subsequent day, when upon receiving the vote of two-thirds of the members present, they shall become a part of the by-laws.

GENERAL RULES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to March 1, 1922, inclusive.)

Rule 1. Advertisements for Publications: At the forty-seventh annual meeting (1889), the Council resolved that no advertisements be solicited or accepted for any of the publications or programs issued by or in the name of the Association, and the General Secretary was instructed to inform annually the Local Secretary and pharmaceutical press of the resolution.

Rule 2. Term of Council Members from Local Branches: At the 55th annual meeting (1907), it was ordered that the three-year term of members of the Council elected by Local Branches of the A. Ph. A. shall date from the last annual meeting of the Association held previous to the date of election of the new Council members by a Local Branch.

Rule 3. Proceedings of National Association of Boards of Pharmacy and American Conference of Pharmaceutical Faculties in A. PH. A. JOURNAL: That space be annually set aside in the JOURNAL of the American Pharmaceutical Association for abstracts of the Proceedings of the meetings of the National Association of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties.

Rule 4. Salary Year of Officers: At the fifty-seventh annual meeting (1909), it was ordered that the salary year of the officers of the American Pharmaceutical Association be changed so as to run from July of one year to July of the next year, instead of, as heretofore, from September to September.

Rule 5. Names of Life Members: At the fifty-seventh annual meeting (1909) it was ordered that the names of life members, new style, be designated in the published Roll and List of Members by means of heavy-faced or black-faced type.

Rule 6. Approval of Application for Membership: At the fifty-eighth annual meeting (1910), it was ordered that the Committee on Membership submit all names of applicants for membership to the respective State representative on the committee for approval before sending the application to the Secretary of the Committee on Membership for submission to the vote of the Council, or if they be sent direct to the Secretary of the Committee on Membership, they shall be sent by him first to the State representative for approval. The Secretary of the Committee on Membership shall have discretionary power in the application of this rule.

Rule 7. Resignations of Members: At the fifty-eighth annual meeting (1910), it was ordered that the resignation of a member may be accepted during the first six months of the fiscal year for which his annual dues are payable.

Rule 8. Address of Welcome at Opening General Session: Address of welcome and responses thereto at the opening general session shall be omitted.

Rule 9. Meetings of Council: The meetings of the Council shall be held in the evenings with the exception of the first and the last sessions.

Rule 10. Time of Section Meetings: The work of the various Sections shall start promptly in the morning at 9:30 o'clock, lasting until 12 o'clock, and in the afternoon at 2 o'clock, lasting until 5 or 6 o'clock.

Rule 11. Section and Association Meetings: The Section and Association meetings shall be confined to mornings and afternoons.

Rule 12. Concurrent Meetings of Sections: The principle of concurrent meetings of the Sections shall be established. There shall be used a series of bulletins in the section rooms notifying members what papers are being read and discussed in the different several Sections.

Rule 13. Manuscripts for Section Meetings: The chairmen of the Sections shall use every endeavor to secure all manuscripts within four weeks of the annual meeting, and shall immediately send them to the General Secretary.

Rule 14. Printing of Accepted Manuscripts: The General Secretary shall have accepted manuscripts printed in advance of the annual meeting, whenever in the judgment of the Chairman of the Section and the General Secretary it is desirable.

Rule 15. Collective Program of Sections: With all manuscripts in hand three or four weeks before the annual meeting, the General Secretary shall prepare a collective program containing the detailed programs of the different Sections and indicating at what particular session any given paper shall come up for reading and discussion.

Rule 16. Editor as Historian: The Editor-in-chief of the Journal shall be *ex-officio* Historian of the Association.

GENERAL RULES OF FINANCE OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to March 1, 1922, inclusive.)

Rule 1. Deposits of Moneys of Funds: The Treasurer shall deposit all moneys received by him except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee and approved by the Council.

Rule 2. Payments of Moneys of Funds: Said moneys shall be deposited in the name of the American Pharmaceutical Association, and shall be paid out by numbered checks drawn by the Treasurer, on written warrant signed by the General Secretary.

Rule 3. Payment of Bills: The correctness of every bill shall be certified to by the person contracting the same and the General Secretary, and the latter shall note on the bill the appropriation against which the same is to be charged. The bill shall then be submitted to the Chairman of the Committee on Finance for approval, before payment is made. A warrant shall then be drawn and signed by the General Secretary, upon receipt of which, together with the original bill and voucher, the Treasurer shall draw a check for the amount.

Rule 4. Deposits in Banks: The Treasurer shall make a daily deposit in bank whenever his receipts amount to $100 or more.

Rule 5. Custodian of Funds: The Treasurer shall be the custodian of the bonds and saving-bank books, representing the several Funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him.

Rule 6. Appointment of Auditing Committee: There shall be annually appointed by the Council an Auditing Committee, this Committee to consist of three members residing in or near the same city or town as that in which the Treasurer resides, the Chairman to be named by the Chairman of the Council.

Rule 7. Annual Report of Treasurer, General Secretary and Editor: The Treasurer, General Secretary and Editor shall balance their books on January 1st of each year and shall make out previous to the fifteenth day of February following, their annual reports for the financial year just closed.

Rule 8. Auditing of Accounts of Treasurer, General Secretary and Editor: The Treasurer, General Secretary and Editor having thus balanced their books and made out their reports, shall place all such books, accounts, vouchers, etc., with the reports, at the disposal of the Chairman of the Auditing Committee at such time and place in February of each year as the said Chairman may direct.

Rule 9. Return of Books to Treasurer, General Secretary and Editor: Said books, accounts, vouchers, saving-bank books and accounts of the same

shall be returned to the Treasurer, General Secretary and Editor, respectively, within two weeks of the date of their reception by the Chairman of the Auditing Committee.

Rule 10. Meeting of Auditing Committee: There shall be a meeting of the Auditing Committee in February of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., received by them; and previous to the first day of March following, to make a report thereon, in writing, to the Chairman of the Council.

Rule 11. Expense of Bonds of Treasurer and General Secretary: The expense of the bonds of the Treasurer and General Secretary given by a Trust Company, shall be paid for from the Treasury.

Rule 12. Merging of Balances: All balances remaining from appropriations at the close of each fiscal year shall be turned back into the treasury, unless otherwise ordered by the Council.

Rule 13. Committee on Invested Savings and Trust Funds: The Chairman of the Council is instructed to appoint three members of the Association who, together with the Treasurer, shall be known as the Committee on Invested, Savings and Trust Funds.

Of the three members first appointed, one shall be appointed for one year, one for two years and one for three years. Each year thereafter, one member shall be appointed for three years. Members of the Committee need not be members of the Council.

It shall be the duty of said committee to carefully consider the nature and status of all invested, savings and trust funds of the Association, and to make an annual written report upon the same to the Council, which report shall be read (in full) at one of the general sessions of the annual convention of the Association, and published (in full) in the annual volume of Proceedings thereof.

The present custody of the funds shall not be affected by the adoption of these resolutions, neither shall the committee have the power to invest or reinvest any of such funds, except as instructed by the Council or Association.

Rule 14. Disposal of Receipts from the National Formulary: The Treasurer shall keep a separate and accurate account of all receipts of and disbursements, for the National Formulary. Any balance of receipts in excess of disbursements, remaining at the end of any fiscal year, after making due allowance for any outstanding indebtedness on behalf of the National Formulary, shall be credited as follows: Fifty per cent to the general funds of the Association as partial repayment for that portion of the overhead charges of the Association incurred on behalf of the National Formulary; and the remaining fifty per cent to the credit of the American Pharmaceutical Association Research Fund. This fund is to be held as a permanent fund by the American Pharmaceutical Association through its Council or controlling body.

Until such time as the American Pharmaceutical Association Research Fund has accumulated from this source or from bequests, contributions, etc.,

a fund of not less than one hundred thousand ($100,000.00) dollars, the Council may expend not more than fifty per cent of the net income of said Fund. When this Research Fund shall exceed one hundred thousand ($100,000.00) dollars, then the Council may expend annually a sum not exceeding the income derived from the investments held by the said Research Fund.

From the funds thus available, the Council may grant such honorariums or awards to encourage investigation and research upon any subjects relating in any way to pharmacy or to the collateral sciences as may in their judgment be deemed proper. In the granting of such honorariums or awards, preference shall be given to such applications or subjects as are recommended by the committees of Revision of the United States Pharmacopoeia or the National Formulary.

Rule 15. Depository of the American Pharmaceutical Association Research Fund: That the selection of the depository and all investments of the funds of the American Pharmaceutical Association Research Fund shall be made by the Treasurer and the Committee on Finance.

Rule 16. Designation of Safe Deposit Vaults for Funds and Securities: That the Committee on Invested and Trust Funds shall annually recommend to the Council the banks and safe deposit vaults in which the funds and securities, respectively, of the Association, shall be kept for the ensuing year.

GENERAL RULES OF PUBLICATION

(Revised to March 1, 1922, inclusive.)

1. Approval and Payment of Bills of Journal: All bills on account of the Journal shall be certified by the Editor and sent as soon as possible to the Chairman of the Committee on Publication for approval and then sent by the latter to the General Secretary for payment in accordance with Article II, Chapter V, of the By-Laws and Rule 3, of the General Rules of Finance, except bills for postage, stationery, drayage, freight, expressage, miscellaneous and clerical expenses of the office of the Journal (Petty and Clerical Expenses, Journal Office), which shall be paid as provided for in Rule 2 of these rules.

2. Bills for Petty and Clerical Expenses, Journal Office: Bills for postage, stationery, drayage, freight, expressage, miscellaneous and clerical expenses of the Office of the Journal (Petty and Clerical Expenses, Journal Office), shall be paid by check by the Editor of the Journal of the American Pharmaceutical Association out of a deposit of $300 to be made to the credit of the Editor of the Journal of the American Pharmaceutical Association in a bank to be approved by the Committee on Publication. The Editor shall be bonded for $500 at the expense of the Association.

The procedure for the payment of such bills shall be as follows: (1) at the end of each month, the Editor shall send all paid-and-receipted bills and cancelled checks, with an itemized bill or statement, to the Chairman of the Committee on Publication for approval; (2) after approval, the Chairman

of the Committee on Publication shall send the bills and checks to the General Secretary for payment in accordance with Article II, Chapter V, of the By-Laws and Rule 3 of the General Rules of Finance; and (3) the Treasurer shall send the Editor a check to cover the amount of the bills and thus increase the bank balance.

3. Bills for Year Book, National Formulary and Publications: All bills on account of the Year Book, National Formulary and other publications of the Association shall be certified to by the person contracting the same and approved by the Chairman of the Committee on Publication and sent by the latter to the General Secretary before payment in accordance with Article II, Chapter V, of the By-Laws, and Rule 3 of the General Rules of Finance.

THE FUNDS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to January 1, 1922.)

At the San Francisco meeting in 1889, the Permanent Secretary was directed to publish annually in the Proceedings, a brief history of the origin, money value, and use to which each Fund may be applied.

There are six Permanent Funds, a General Fund, and two Trust Funds at the present time.

The Permanent Funds are (1) Life Membership; (2) Ebert Prize; (3) Centennial; (4) Endowment; (5) Ebert Legacy; (6) American Pharmaceutical Association Research Fund.

PERMANENT FUNDS

THE A. PH. A. LIFE MEMBERSHIP FUND.

The Constitution, as originally adopted in 1852, and up to the year 1856, contained no provision for life membership or for the creation of a permanent fund. In the year named a revised Constitution was reported by a committee, and after consideration, adopted (see Proceedings, 1856, pp. 12, 14, 27 and 79), Article II, Section 7 (afterwards Section 8), containing the following provision:

"Members who have paid their annual contribution for ten successive years shall be considered life members and exempt from their yearly payments, and entitled to a certificate to that effect."

Owing to increased expenditures for the publication of the Proceedings, etc., the Association found it necessary in 1867 (Proceedings, p. 75) to increase its revenue, one of the measures being the erasing of Section 8, and the total abandonment of life membership in the future.

In 1870 a revised Constitution was adopted (see Proceedings, 1870, pp. 87-96) and this, with a few slight amendments adopted in 1896 and 1900, read as follows:

"Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the interest of which for any current year only may be used by the Association for its expenses."

In 1913 this article was amended to read as follows and is now in force:

"Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, may be invested by the Treasurer in United States Government, State, Municipal, County or other securities acceptable as security for postal savings deposits, the interest of which for any current year only may be used by the Association for its expenses."

Chapter VI, Article 5, of the By-Laws adopted the same year, read as follows: "Any member who shall pay to the Treasurer the sum of *seventy-five dollars at a time* shall become a life member, and shall be exempt from all future annual contributions."

This article was amended in 1888 and 1896 and again in 1906, and changed to Article IV, Chapter VIII. As now in force, it reads as follows:

"Any member of the Association who shall pay to the Treasurer the sum of $100.00 during the first year of his connection therewith, and also any member not in arrears, who after ten years shall pay the sum of $75.00, or after fifteen years the sum of $50.00, or after twenty years the sum of $40.00, or after twenty-five years the sum of $25.00, and any member who may have paid annual dues for thirty-seven consecutive years, shall become a life member, and shall be exempt from all future annual contributions."

In the roll of members for the year 1872 (p. 338) the name of the late Charles W. Badger, of Newark, N. J., appears for the first time as a life member, and the only one (until the time of his death in 1877) under this provision, which was subsequently modified (Proceedings, 1879, p. 799) so as to reduce the sum to be paid into the treasury by those who had been members for from five to twenty years. In the same year the published roll contained the names of two new life members. The article on life membership was further modified in 1888 (Proceedings, p. 52), again in 1896 (Proceedings, p. 17), and again in 1906 (Proceedings, p. 100), so as to apply to those who have been members for over twenty years (see Chapter VIII, Article IV, of the By-Laws). Under this clause the life membership (new style) of the present roll is one hundred and sixteen.

The Treasurer's report for 1880 (p. 524) states the life membership fund to be $75, for 1881 (p. 513) $613, for 1882 (p. 608) $685, for 1883 (p. 436) $904.38, and for 1884 (p. 524) $944.11. At the Milwaukee meeting, held in the same year, the Association directed (Proceedings, p. 525) that $316, which amount had been in past years donated to the funds of the Association by various members, be withdrawn from the general fund to be added to the Life Membership Fund. At the Providence meeting in 1886 (Proceedings, p. 147) it was recommended by the Finance Committee, and approved by the Council and by the Association, that the sum of $3,000 be transferred from

the general fund to the Life Membership Fund. At the Cincinnati meeting in 1887 (Proceedings, p. 471) the Association ordered again a transfer to the same fund of $4,000.

From 1887 to 1909 the annual reports of the Chairman of the Council give the number of each bond of the registered securities in which the Life Membership Fund is invested. Since 1910 the Treasurer has made this report. By vote of the Association, the name of this fund was changed to the William Procter, Jr., Fund on September 15, 1902 (see Proceedings, 1902, p. 214), but was changed back to its original name, Life Membership Fund, on September 5, 1906 (see Proceedings, 1906, p. 100). The report of the Treasurer of the Association shows that on January 1, 1922, the value of the Life Membership Fund was $27,638.35, of which sum the interest for any current year only may be used by the Association for its expenses. Massachusetts State Bonds to the amount of $13,000 and $14,100 of Liberty Bonds are in this fund (face value).

THE EBERT PRIZE FUND.

At the Richmond meeting in 1873 (Proceedings, p. 58), Mr. Albert E. Ebert presented to the Association the sum of five hundred dollars to be used in the following manner:

"The money to be properly invested by order of the Executive Committee, and the annual interest derived therefrom to be appropriated for *conferring a suitable prize* for the best essay or written contribution containing AN ORIGINAL INVESTIGATION OF A MEDICINAL SUBSTANCE, determining new properties, or containing other meritorious contributions to knowledge; or for IMPROVED METHODS of determining merit, for the preparation of chemical or pharmacal products; the prize to be awarded by a suitable committee within six months after the annual meeting at which the essays are presented for competition; provided, that in case none of the essays offered is of sufficient merit to justify the award, in the judgment of the Committee on Prize Essays, all may be rejected, and the sum added to that of the Fund."

The offer was accepted by the Association, and by a special vote (*Ibid.*, p. 70) the fund was ordered to be called the *Ebert Fund,* and the prize awarded from the proceeds to be known as the *Ebert Prize.*

The Ebert Prize was awarded for the year 1874 to Charles L. Mitchell; for 1877, to Fred B. Power; for 1882, to John U. Lloyd; for 1886, to Emlen Painter; for 1887, to Edward Kremers; for 1888, to Jos. F. Geisler; for 1890, to Wm. T. Wenzell; for 1891, to John U. Lloyd; for 1897, to Albert B. Prescott and Jas. W. T. Knox; for 1898, to Virgil Coblentz; for 1899, to Henry Kraemer; for 1900, to Edward Kremers and Oswald Schreiner; for 1902, to J. O. Schlotterbeck and H. C. Watkins; for 1903, to Fred B. Power; for 1905, to Dr. Ernest Schmidt of Germany; for 1906, to J. O. Schlotterbeck and H. C. Watkins; for 1907, to Fred B. Power and Frank Tutin; for 1908, to A. B. Stevens and L. E. Warren; for 1909, to Henry Kraemer; for 1910, to Harry M. Gordin; for 1911, to W. A. Puckner and L. E. Warren; for 1915, to E. N. Gathercoal; for 1916, to John Uri Lloyd; for 1919 to Arno Viehover; for 1920 to Geo. D. Beal; for 1921, to Albert Schneider.

The Ebert Fund amounted in 1883 (Proceedings, p. 436) to $683.43. From 1887 to 1909 the reports of the Chairman of the Council specify the securities in which this fund is invested. Since 1910 the report has been made by the Treasurer. The annual interest must be applied to a prize for an original investigation meeting the requirements stated above.

In accordance with the recommendation of the committee on invested savings and trust funds, submitted and adopted at the fifty-eighth annual meeting (see Proceedings, 1910, p. 454) the name of the Ebert Fund was changed to Ebert Prize Fund, and the amount of the prize limited to $25.00 until the excess of interest above the sum annually awarded and added to the principal shall amount to $1,000.00, after which the entire annual interest upon the same shall constitute the Ebert Prize. On January 1, 1921, the Fund was $1,346.85. Of this amount $1,200 is in Liberty Bonds (face value).

THE A. PH. A. CENTENNIAL FUND.

After the meeting held in Philadelphia in 1876, the local committees, on settling all accounts for the entertainment of the Association, had an unexpended balance left which by subsequent collections made in Philadelphia was increased to $525. At the Toronto meeting in 1877 (Proceedings, p. 481), Dr. A. W. Miller, local secretary for 1876, presented this sum in the name of the local committees to the Association, with this condition, "that a like amount be subscribed by the members within one year," with a view of establishing a fund to *aid in the prosecution of original investigations,* the interest accruing from the investment of the fund to be devoted to the defraying of expenses actually incurred by members in conducting investigations in some branch of science connected with pharmacy. The Association accepted the conditions (*Ibid.,* pp. 226-528), and adopted the name *Centennial Fund.*

The collection of a like amount by the Association was completed at the Saratoga meeting (Proceedings, 1880, p. 553) when $582.81 had thus been received. In the following year a committee of the Centennial Fund was provided for in the By-Laws of the Council, Chapter VII (Proceedings, 1881, pp. 190, 549). Members have not availed themselves of this fund to the extent contemplated at its foundation; for the amounts paid out have been only $7.50 to Robt. B. Warder for material used for investigations reported in 1885; $96.80 used by the Committee on National Formulary during the years 1886 and 1887 (Proceedings, 1889, p. 16); and $32 to Edward Kremers for material necessary for the prosecution of scientific research on the menthol group, reported in the Proceedings for 1892; $50 to the same investigator in 1893, and $50 again to the same investigator in 1894. In 1896 the sum of $22.33 was paid to the Committee on Indicators for material used in their investigations. In 1915 the sum of $100 was paid Edward Kremers for research work on cultivation of medicinal plants.

The original sum of $1,107.81 ($525 + $582.81) had increased in 1883 to $1,232.76. From 1887 to 1909 the securities in which the fund is invested are specified in the reports of the Chairman of the Council. Since 1910 the reports have been made by the Treasurer. The interest accruing from this Fund is to be used for defraying the expenses incurred in conducting original

investigations in pharmacy or an allied science. The value was $3,722.17 (face value of securities) on January 1, 1922. The Fund has $1,000 Massachusetts State Bond, $2,600 Liberty Bonds.

THE A. PH. A. ENDOWMENT FUND.

At the fifty-fourth annual meeting held at Indianapolis, Ind., September, 1906, Messrs. Samuel A. D. Sheppard and James H. Beal proposed the establishment of a permanent fund to be known as the "Endowment Fund" (see Proceedings, 1906, p. 99), under the following conditions:

"That the said S. A. D. Sheppard and James H. Beal jointly agree to pay into said fund one dollar for each twenty dollars contributed and paid into said fund by all other members of this Association up to and until such Endowment Fund shall, with its accumulations of interest, reach the sum of twenty-five thousand ($25,000) dollars.

"That as money shall be received as additions to said fund the same shall be invested in such securities as the Council may direct until the interest and other accumulations, together with the amount of the principal, shall reach the sum of twenty-five thousand ($25,000) dollars.

"That when the Endowment Fund shall have reached the sum of twenty-five thousand ($25,000) dollars, one-half the income derived therefrom may be used for any purpose deemed wise by the Association.

"That when said Endowment Fund, inclusive of donations, interest and other accumulations, shall amount to the sum of fifty thousand ($50,000) dollars, the Association may use ninety per cent. of the income therefrom for any purpose deemed wise by the Association.

"That under no circumstances whatever shall all the income from said fund be used, but at least ten per cent. thereof shall be annually added to the principal of the Endowment Fund.

"That under no circumstances whatever shall the principal or any part thereof be used for any purpose except investment for income, nor pledged for any debt or obligation of the Association, or any person, nor used for any other purpose or in any other manner than as specified."

Contributions to the Endowment Fund have been made at different times, and the names of the contributors published in the annual volume of Proceedings (see Proc., 1907, pp. 47 and 48; Proc., 1908, pp. 476 and 477; Proc., 1909, p. 464; Proc., 1910, p. 478). According to the Treasurer's report, the total amount contributed and interest accumulations up to January 1, 1922, was $9,057.58. The Fund has $8,600 in Liberty Bonds (face value).

RICE MEMORIAL FUND. A joint committee was appointed by the Chairman of the Committee of Revision of the U. S. P., on June 26, 1901, to report to the Board of Trustees and Committee of Revision upon a suitable plan for honoring the memory of Dr. Charles Rice.

It was decided, after hearing the report of the Committee, to erect a monument over Dr. Charles Rice's grave and to prepare a memoir containing a biographical sketch of his life.

The monument over the grave was dedicated July 7, 1903, with the members of the Board of Trustees among those present. The memoir, a volume of sixty-four pages, was published and distributed in 1904.

March 22, 1905 (see Item No. 428 in Abstract of Minutes of Board of Trustees, 1900-1910), on motion of Dr. H. C. Wood, the balance of the Rice Memorial Fund was accepted as voted by the Revision Committee and the Chairman was requested to appoint a committee of one, to be known as the Rice Memorial Committee, to take charge of this fund and deposit it in the name of the Board of Trustees of the U. S. P. Convention. This motion was carried and the Chairman appointed Mr. S. A. D. Sheppard to constitute the committee.

Under date of November 22, 1910, Dr. A. R. L. Dohme, representing his father, Dr. Charles E. Dohme, the retiring chairman of the Board of Trustees, turned over to Chairman James H. Beal, of the present Board, bank-book No. 55828, of the Boston Penny Savings Bank, with an account, amounting to one hundred and forty-nine dollars and forty-three cents ($149.43) to its credit on October 1, 1910, the same standing in the name of Samuel A. D. Sheppard, Committee of Trustees, of the United States Pharmacopoeial Convention.

June 6, 1913, the Board of Trustees of the U. S. P. C. inquired of the A. Ph. A. whether the organization would accept the custodianship of the Rice Memorial Fund (U. S. P. C. Board of Trustees minutes, Item 488, p. 365). The Council of the A. Ph. A. voted to accept the Fund in trust.

The transfer was made November 22, 1913, the amount being $168.21.

January 1, 1919, the fund amounted to $183.65.

On recommendation of the Treasurer this fund amounting to $194.68 was transferred to the Endowment Fund (see A. Ph. A. JOURNAL, October, 1919, p. 861).

THE COLLEGE PRIZE FUND (MOTTER FUND). On August 4, 1905, Dr. Murray Galt Motter, of Washington, D. C., placed in the treasury of the American Pharmaceutical Association the sum of $25.00, the same to be awarded as prizes by the National College of Pharmacy to the members of the classes of 1906, 1907, 1908, 1909, 1910, of said College.

This money, deposited in the Boston Penny Savings Bank in the name of the Treasurer of the A. Ph. A., was held as a special fund, to be drawn upon as the prize students were named by the National College of Pharmacy and their applications for membership in the American Pharmaceutical Association approved.

No demands having been made on the Fund, on recommendation of the Treasurer this Fund amounting to $43.47 was transferred to the Endowment Fund (see JOURNAL A. Ph. A., October, 1919, p. 861).

THE EBERT LEGACY FUND. The late Albert E. Ebert having by his will designated the A. Ph. A. as residuary legatee of his estate, it was ordered

at the fifty-eighth annual meeting on recommendation of the Committee on Invested Savings and Trust Funds, that the money received from the estate be converted into a fund to be known as the Ebert Legacy Fund, and that this fund be invested in municipal or other public bonds approved by the Committee on Invested Savings and Trust Funds and the Finance Committee, and that this fund be kept intact and the income added thereto until the fund and its accumulation shall together amount to a total of $10,000.00.

When this sum has been reached, the income derived from the fund shall be devoted to such purposes as will in the opinion of the Council best commemorate the founder of the fund and his services to pharmacy.

The reason for the suggestion that the Ebert Fund and the Ebert Legacy Fund be kept separate was, that the first was given by Mr. Ebert for a specific purpose, while the latter was given to the Association practically without restriction and with the evident intention that the Association should use it in the manner which it deemed best.

On December 14, 1909, the executors of the Ebert estate paid over to the Treasurer of the A. Ph. A. the sum of $2,800.00. The Treasurer's report states that January 1, 1922, this fund amounted to $5,167.11. The Fund has $2,000 in St. Louis City Bonds and $3,000 in Liberty Bonds (face value).

AMERICAN PHARMACEUTICAL ASSOCIATION RESEARCH FUND. The Association at the 1915 meeting took the first action resulting in this fund. It was then decided to make the net balance each year in the National Formulary account a part of the Endowment Fund (see JOURNAL A. PH. A., November, 1915, p. 1376). The following rule was adopted:

"Rule 14. Disposition of Receipts From National Formulary: The Treasurer shall keep a separate and accurate account of all receipts and disbursements for the National Formulary. Any balance of receipts in excess of disbursements remaining at the end of any fiscal year shall be credited to the Endowment Fund and become a part thereof."

The Committee on Publication at the 1916 meeting recommended the modification of Rule 14, and the establishment of a National Formulary Revision and Research Fund (see JOURNAL A. PH. A., October, 1916, pp. 1142 and 1144, and November, 1916, p. 1280). This resulted in the appointment of a committee to report at the 1917 meeting. Under these conditions no money was paid into the Endowment Fund under Rule 14.

The net amount to the credit of the National Formulary IV during the year 1916 was $13,903.67 (see JOURNAL A. PH. A., August, 1917, p. 749).

At the 1917 meeting the Association changed Rule 14 to read as follows (see JOURNAL A. PH. A., December, 1917, p. 1100):

"Rule 14. Disposal of Receipts From the National Formulary: The Treasurer shall keep a separate and accurate account of all receipts of and

disbursements for the National Formulary. Any balance of receipts in excess of disbursements, remaining at the end of any fiscal year, after making due allowance for any outstanding indebtedness on behalf of the National Formulary, shall be credited as follows: Fifty per cent. to the general funds of the Association as partial repayment for that portion of the overhead charges of the Association incurred on behalf of the National Formulary; and the remaining fifty per cent. to the credit of the American Pharmaceutical Association Research Fund. This fund is to be held as a permanent fund by the American Pharmaceutical Association through its Council or controlling body.

"Until such time as the American Pharmaceutical Association Research Fund has accumulated from this source or from bequests, contributions, etc., a fund of not less than one hundred thousand ($100,000.00) dollars, the Council may expend not more than fifty per cent. of the net income of said Fund. When this Research Fund shall exceed one hundred thousand ($100,000.00) dollars, then the Council may expend annually a sum not exceeding the income derived from the investments held by the said Research Fund.

"From the funds thus available, the Council may grant such honoraria or awards to encourage investigation and research upon any subject relating in any way to pharmacy or to the collateral sciences as may in their judgment be deemed proper. In the granting of such honoraria or awards, preference shall be given to such applications or subjects as are recommended by the committees of Revision of the United States Pharmacopoeia or of the National Formulary."

In accordance with instructions of the association (see JOURNAL A. PH. A., December, 1917, p. 1100) the Treasurer transferred 50 per cent. of the National Formulary Research Fund to the American Pharmaceutical Association Research Fund and 50 per cent. to the general funds of the Association. This with the interest gave the A. Ph. A. Research Fund $7,043.31. To this has been added $4,059.24 from the Nationary Formulary IV account for 1917, $1,976.49 for 1918, $2,226.77 for 1919, and $2,020.84 for 1920. The interest increased this to $19,954.91 on January 1, 1922. The Fund has $14,100 in Liberty Bonds (face value).

THE A. PH. A. GENERAL FUND. On February 26, 1909, the Council directed that $5,000.00 of the current funds of the Association be invested by the Treasurer in some interest-bearing security, to be approved by the Finance Committee and the Chairman of the Council (see Proc., 1909, p. 449). In accordance with this order the Treasurer reported on May 26, 1909, having purchased five $1,000.00 St. Louis, Mo., 4 per cent bonds (face value), at 103⅝ and accrued interest. Again, on November 15, 1909, the Treasurer, in accordance with an order of the Council (see Motion No. 11, p. 449), invested $5,000.00 of the current funds of the Association in St. Louis public buildings and public works 4 per cent gold bonds (face value). By authority of the Council, $15,000 was transferred November 5, 1920, from the International Bank of St. Louis to the Boston Penny Savings Bank. On January 1, 1922, the total fund was $26,335.03.

TRUST FUNDS

The following funds are held in trust by the A. Ph. A.: (1) Wm. Procter, Jr., Monument; (2) Jos. P. Remington Honor Medal Fund.

THE WM. PROCTER, JR., MONUMENT FUND.

At the fifty-second annual meeting held at Kansas City, Mo., September, 1904, it was resolved to solicit subscriptions for a memorial monument to be erected in the Smithsonian Grounds at Washington, D. C., to the memory of William Proctor, Jr., if possible in 1917, the centennial anniversary of his birth. A committee was appointed to take the matter in charge, which since that time has been active in soliciting subscriptions. The names of contributors have been published from time to time in the annual volume of Proceedings (see Proc., 1906, p. 63; Proc., 1907, p. 98).

In September, 1907, at the annual meeting held in New York City, the Association directed that all moneys collected for the William Procter, Jr., Monument Fund be turned over to the Treasurer of the A. Ph. A. to be deposited on interest for the benefit of said fund (see Proc., 1907, p. 99). The Treasurer of the A. Ph. A., in his annual report for 1908-1909, reports having received on January 27, 1909, the sum of $3,413.33 from the Treasurer of the Committee, Benj. T. Fairchild. The total sum to the credit of this fund, according to the Treasurer's report on January 1, 1922, amounted to $10,663.23. The Fund has $10,400 in Liberty Bonds (face value).

JOSEPH REMINGTON HONOR MEDAL.

At the April 8, 1918, meeting of the New York Branch of the A. Ph. A., a special committee reported the following recommendations which were adopted by the Branch and later by the Council of the A. Ph. A.:

"That a gold medal to be known as the Joseph P. Remington medal and suitably engraved be awarded to the man or woman who has done most for American Pharmacy during the preceding year or whose efforts during a number of years have culminated to a point during the preceding year where the result of these efforts would be considered as being the most important and advantageous for American Pharmacy. That no bar be placed as to the candidate's profession or kind of work accomplished.

"That the Special Committee on the Pharmacy Honor Medal be empowered, in order to make the presentation of this award permanent and perpetual, to raise a fund of $1,000.00 and in addition sufficient money to pay the initial expenses of die, postage, etc. That this money be raised by obtaining a contribution of $100.00 from the Branch treasury and the rest to be made up by voluntary contributions from the members and firms in New York City and vicinity. That the $1,000.00 fund be invested in Liberty Bonds, which bonds are to be held in trust by the Treasurer of the American Pharmaceutical Association.

"That the medal be awarded by a standing committee consisting of all the past presidents of the American Pharmaceutical Association, and in case the

number of living past presidents is less than five the senior past vice-presidents of the American Pharmaceutical Association are to be drawn upon in sufficient number to create a committee of five. The Secretary of the New York Branch is to act as Secretary of this standing committee.

"That the medal be presented by the Senior Past President of the Local Branch or in his inability to do so by other past-presidents in the order of their seniority.

"That the New York Local Branch of the American Pharmaceutical Association take the matter in hand to the extent of devoting the regular April meeting annually to the presentation of this medal."

The first Remington Honor Medal was awarded to James Hartley Beal, the second to John Uri Lloyd.

On January, 1, 1922, the Fund was $1,205.79 of which $1,100 is invested in Liberty Bonds (face value).

ASSOCIATION BONDS ARE REGISTERED

All bonds of the Association are registered in the name of the American Pharmaceutical Association and kept in the Association safe deposit box.

For a detailed account of each of the funds of the Association, see the annual reports of the Treasurer published in the JOURNAL of the A. Ph. A. for previous years and this volume for the fiscal year, 1920.

HENRY M. WHELPLEY, *Treasurer.*

REPORT OF TREASURER

January 1, 1920, to January 1, 1921.

By Henry M. Whelpley, St. Louis, Mo.

RECEIPTS.

On hand January 1, 1920—General Fund, viz.			
St. Louis City 4% Registered Bonds			$10,000.00
Boston Penny Savings Bank			15,000.00
Cash on hand International Bank.			
Current Account	$ 4,567.08		
(National Formulary IV)	2,226.77		6,793.85
Annual Dues and Journal, 1917	$ 5.00		
Annual Dues and Journal, 1918	10.00		
Annual Dues and Journal, 1919	60.00		
Annual Dues and Journal, 1920	9,235.00		
Annual Dues and Journal, 1921	5,250.00		
Annual Dues and Journal, 1922	25.00		
Annual Dues and Journal, 1923	5.00	$14,590.00	
Annual Dues only, 1920	$ 64.00		
Annual Dues Only 1921	36.00	100.00	
Miscellaneous Annual Dues		7.50	
Certificates of Membership—Paper at $3.00		21.00	
Certificates of Membership—Parchment at $5.00		30.00	
Journal Advertising		7,770.97	
Journal Subscription		559.36	
Reprints		710.33	
Proceedings		152.92	
Year Book		98.80	
Miscellaneous (Amer. J. of Ph., Carbon Paper, etc.)		2.25	
Type Cuts		1.74	
Half-Tone Engraving		5.00	
Badges and Bars		23.25	
Buttons (gold)		2.00	
Buttons (Plated)		.25	
Pins (Gold)		1.00	
Pins (Plated)		.25	
Bank Exchange	$ 1.45		
Interest on Deposit International Bank	248.45		
Interest on St. Louis City Registered Bonds	400.00		
National Formulary I-II-III	3.50		
		$24,730.02	
National Formulary IV		6,642.25	

FOR THE A. PH. A. PERMANENT FUNDS

Life Membership	$ 1,214.20	
Ebert Prize	133.19	
Centennial	134.34	
Endowment	345.33	
Ebert Legacy	197.63	
Research	3,307.56	
General	547.95	$ 5,880.20

FOR FUNDS HELD IN TRUST

Procter Monument	$ 417.55		
Joseph P. Remington Honor Medal	302.98	720.53	
Total Receipts January 1, 1921			$37,973.00
Grand Total			$44,766.85

DISBURSEMENTS BY VOUCHER CHECK.

Jan.	5	Check	No.	3297	Burgmeier Book Bindery		
					Miscellaneous		56.25
"	"	"	"	3298	E. F. Greathead		
					Printing, Postage, Stationery		9.90
"	7	"	"	3299	Louis C. Hesse		
					Printing, Postage, Stationery		6.75
"	"	"	"	3300	Wm. B. Day		
					Clerical	32.00	
					Miscellaneous	6.93	38.93
"	15	"	"	3301	E. G. Eberle		
					Salaries	312.50	
					Journal a	31.13	
					" b	60.00	
					" c	27.39	
					" d	25.82	456.84
"	"	"	"	3302	Eschenbach Ptg. Co.		
					Printing, Postage, Stationery	1.60	
					Commercial Section	2.80	
					Receipt Book	1.40	
					Journal a	830.39	
					W. V. Section	5.09	841.28
"	16	"	"	3303	James Arnold		
					National Formulary V		21.75
"	21	"	"	3304	Buxton & Skinner		
					Printing, Postage, Stationery		22.90
Feb.	2	"	"	3305	J. B. Lippincott Co.		
					National Formulary IV		126.25
"	"	"	"	3306	Physicians Stationery Co.		
					National Formulary V		68.45
"	7	"	"	3307	Wm. B. Day		
					Printing, Postage, Stationery	20.00	
					Clerical	40.00	
					Miscellaneous	1.75	
					Traveling Expenses	30.04	91.79

Feb.	7,	Check	No.	3308	E. G. Eberle		
					Salaries	$312.50	
					Journal b	75.00	
					" c	16.90	
					" d	27.59	$431.99
"	"	"	"	3309	Eschenbach Printing Co.		
					Journal a		730.03
"	10	"	"	3310	W. T. Robinson		
					Printing, Postage, Stationery		1.50
"	16	"	"	3311	W. D. Walters		
					World War Vet. Section		46.48
"	20	"	"	3312	L. E. Sayre		
					Traveling Expenses		36.56
"	"	"	"	3313	Buxton & Skinner		
					Printing, Postage, Stationery		3.00
Mar.	4	"	"	3314	E. F. Greathead		
					Printing, Postage, Stationery		20.00
"	"	"	"	3315	Lewis C. Hopp		
					Traveling Expenses		49.39
"	"	"	"	3316	J. W. England		
					Traveling Expenses		86.98
"	"	"	"	3317	W. D. Walter		
					World War Vet. Section		125.00
"	"	"	"	3318	Geo. H. Geiger & Co.		
					World War Vet. Section		42.25
"	"	"	"	3319	A. G. DuMez		
					Scientific Section		16.75
"	6	"	"	3320	G. M. Beringer		
					Traveling Expenses		92.40
"	"	"	"	3321	E. G. Eberle		
					Traveling Expenses		86.98
"	11	"	"	3322	Wm. B. Day		
					Clerical	32.00	
					Miscellaneous	3.10	
					Year Book	2.87	37.97
"	"	"	"	3323	Eschenbach Printing Co.		
					Journal a		684.56
"	"	"	"	3324	E. G. Eberle		
					Salaries	312.50	
					Journal b	64.00	
					" c	18.60	
					" d	29.81	424.91
"	16	"	"	3325	E. F. Greathead		
					Printing, Postage, Stationery		29.95
"	"	"	"	3326	Louis C. Hesse		
					Printing, Postage, Stationery		4.00
"	27	"	"	3327	H. M. Whelpley		
					Printing, Postage, Stationery	18.75	
					Miscellaneous	39.65	58.40
"	"	"	"	3328	Louis C. Hesse		
					Printing, Postage, Stationery		9.25
"	"	"	"	3329	Mutual Printing & Lith. Co.		
					Section on Com. Interests		19.50

April	1,	Check No.		3330	E. F. Greathead		
					Printing, Postage, Stationery.....		$ 10.50
"	6	"	"	3331	J. W. England		
					Printing, Postage, Stationery.....		82.09
"	8	"	"	3332	Wm. B. Day		
					Clerical.....	$ 32.00	
					Miscellaneous (Bank Exchg.).....	.10	32.10
"	14	"	"	3333	J. B. Lippincott Co.		
					National Formulary IV.....		102.50
"	"	"	"	3334	E. G. Eberle		
					Salaries.....	312.50	
					Journal a.....	26.64	
					" b.....	63.25	
					" c.....	22.48	
					" d.....	32.62	457.49
"	"	"	"	3335	Eschenbach Printing Co.		
					Printing, Postage, Stationery.....	12.17	
					Women's Section.....	5.76	
					Journal a.....	938.31	956.24
"	"	"	"	3336	W. T. Robinson		
					Printing, Postage, Stationery.....		10.50
"	"	"	"	3337	Wilbur L. Scoville		
					National Formulary V.....		51.53
"	15	"	"	3338	Louis C. Hesse		
					Printing, Postage, Stationery.....		6.75
"	29	"	"	3339	Wm. B. Day		
					Printing, Postage, Stationery	10.00	
					Clerical.....	40.00	
					Com. on Membership.....	48.50	98.50
"	"	"	"	3340	W. D. Walters		
					World War Vet. Section.....		69.69
"	"	"	"	3341	H. M. Whelpley		
					Printing, Postage, Stationery.....	91.53	
					Miscellaneous.....	11.42	102.95
"	"	"	"	3342	E. F. Greathead		
					Printing, Postage, Stationery.....		13.75
"	"	"	"	3343	Louis C. Hesse		
					Printing, Postage, Stationery.....		4.50
"	"	"	"	3344	Imitation Type. & Addressing Co.		
					Com. on Membership		81.68
May	17	"	"	3345	Imitation Type. & Addressing Co.		
					Com. on Membership.....		26.65
"	"	"	"	3346	P. Henry Utech		
					Com. on Membership.....		9.25
"	"	"	"	3347	E. G. Eberle		
					Salaries	312.50	
					Journal b.....	87.00	
					" a.....	32.15	
					" c.....	34.78	
					" d.....	46.74	513.17
"	"	"	"	3348	Eschenbach Printing Co.		
					Journal a.....		672.92

May	17,	Check No.		3349	E. F. Greathead		
					Printing, Postage, Stationery		$ 22.50
"	"	"	"	3350	H. V. Arny		
					Printing, Postage, Stationery	$ 6.08	
					Year Book (1918-1920)	42.95	49.03
"	"	"	"	3351	G. H. Gowvy		
					Section on Membership	2.40	
					Section on Ed. and Legislation	1.86	4.26
"	"	"	"	3352	T. W. Bohn & Co.		
					Section on Ed. & Legislation		23.43
"	"	"	"	3353	A. H. Fetting		
					Badges and Bars		39.38
"	"	"	"	3354	Arno Viehover		
					Special "Ebert Prize"		40.00
"	"	"	"	3355	Robert P. Fischelis		
					Miscellaneous	1.75	
					World War Vet. Section	13.86	15.61
"	26	"	"	3356	J. W. England		
					Salaries	108.33	
					Printing, Postage, Stationery	43.75	
					Traveling Expenses	45.98	198.06
"	"	"	"	3357	E. F. Greathead		
					Printing, Postage, Stationery		43.70
"	"	"	"	3358	N. Noll		
					Com. on Membership		3.50
"	"	"	"	3359	Wm. B. Day		
					Miscellaneous	1.27	
					Traveling Expenses	106.67	107.94
"	"	"	"	3360	Geo. D. Beal		
					Ebert Prize		40.00
"	29	"	"	3361	Eschenbach Printing Co.		
					World War Vet. Section		55.60
June	4	"	"	3362	E. A. Ruddiman		
					Sec. on Pract. Pharm. and Desp.		27.13
"	14	"	"	3363	Wm. B. Day		
					Clerical	32.00	
					Miscellaneous	1.57	33.57
"	"	"	"	3364	H. M. Whelpley		
					Traveling Expenses	85.50	
					Printing, Postage, Stationery	1.33	
					Miscellaneous	8.29	95.12
"	"	"	"	3365	Ketcheson Printing Co.		
					World War Vet. Section		40.00
"	"	"	"	3366	Geo. H. Geiger & Co.		
					World War Vet. Section		3.50
"	"	"	"	3367	Arthur Johnson Mfg. Co.		
					Remington Honor Medal		35.00
"	"	"	"	3368	Louis C. Hesse		
					Printing, Postage, Stationery		5.75
"	"	"	"	3369	Louis C. Hesse		
					Printing, Postage, Stationery		9.00

June	14,	Check No.	3370	The Capital Shorthand Reporting Co., Stenographers			$240.00
"	16	"	" 3371	Eschenbach Printing Co.			
				Printing, Postage, Stationery		$ 4.50	
				Journal a		587.43	591.93
"	"	"	" 3372	Keenan-Murphy Type W. Exc. Miscellaneous			5.50
"	"	"	" 3373	E. G. Eberle			
				Salaries		312.50	
				Stenographers		3.35	
				Historical Section		6.50	
				Journal b		69.20	
				" c		17.57	
				" d		63.04	472.16
"	23	"	" 3374	Curtis & Hyde			
				National Formulary V			40.00
"	"	"	" 3375	L. E. Sayre			
				Printing, Postage, Stationery		3.00	
				Miscellaneous		1.77	
				Traveling Expenses		2.16	6.93
"	"	"	" 3376	W. D. Walters			
				World War Vet. Section			78.00
"	"	"	" 3377	Wm. B. Day			
				Salaries		375.00	
				Clerical		32.00	
				Miscellaneous		1.75	408.75
"	"	"	" 3378	H. S. Noel			
				Section on Commercial Int.			2.78
"	"	"	" 3379	Louis C. Hesse			
				Printing, Postage, Stationery			49.75
July	1	"	" 3380	H. V. Arny			
				Salaries			300.00
"	"	"	" 3381	A. G. DuMez			
				Salaries		41.67	
				Printing, Postage, Stationery		20.54	62.21
"	"	"	" 3382	H. M. Whelpley			
				Salaries			500.00
"	"	"	" 3383	F. A. Upsher Smith			
				Com. on Membership			45.00
"	"	"	" 3384	Journal A. Ph. A..			
				World War Vet. Section			62.10
"	25	"	" 3385	E. G. Eberle			
				Salaries		312.50	
				Journal a		18.87	
				" b		64.00	
				" c		18.50	
				" d		58.89	472.76
"	"	"	" 3386	Eschenbach Printing Co.			
				Journal a			700.51
"	"	"	" 3387	H. A. B. Dunning			
				National Formulary V			35.00
"	"	"	" 3388	Bernard Fantus			
				National Formulary V			104.74

July	25,	Check	No.	3389	O. A. Farwell		
					National Formulary V		$ 76.62
"	"	"	"	3390	P. Henry Utech		
					National Formulary V		61.25
"	"	"	"	3391	W. L. Scoville		
					National Formulary V		69.90
"	"	"	"	3392	H. Engelhardt		
					National Formulary V		30.00
"	"	"	"	3393	Clyde M. Snow		
					National Formulary V		25.00
"	"	"	"	3394	Otto Raubenheimer		
					National Formulary V		26.00
"	"	"	"	3395	S. L. Hilton		
					National Formulary V		37.24
"	"	"	"	3396	H. V. Arny		
					National Formulary V		21.21
"	"	"	"	3397	Clyde M. Snow		
					National Syllabus Com.		25.00
"	"	"	"	3398	Jeff K. Stone		
					Auditing Treas. Accounts		75.00
"	"	"	"	3399	R. P. Fischelis		
					Traveling Expenses		14.00
"	"	"	"	3400	Louis C. Hesse		
					Printing, Postage, Stationery		11.00
"	"	"	"	3401	A. Ph. A. Research Fund		
					Half Net Profit, N. F. IV		2,226.77
Aug.	2	"	"	3402	E. Fullerton Cook		
					Traveling Expenses		10.00
"	"	"	"	3403	Pearson's Printing Office		
					Printing, Postage, Stationery		67.92
"	"	"	"	3404	The Philadelphia Branch of A. Ph. A. Membership Committee		26.00
"	"	"	"	3405	Leonard A. Seltzer		
					National Formulary V		72.35
"	"	"	"	3406	E. L. Newcomb		
					National Formulary V		137.90
"	13	"	"	3407	Wm. B. Day		
					Printing, Postage, Stationery	$ 10.00	
					Clerical	40.00	50.00
"	14	"	"	3408	Eschenbach Printing Co.		
					Year Book VII		5,006.28
"	18	"	"	3409	E. G. Eberle		
					Salaries	312.50	
					Journal a	36.43	
					" b	76.50	
					" c	31.58	
					" d	61.96	518.97
"	"	"	"	3410	Eschenbach Printing Co.		
					Journal a	619.66	
					Printing, Postage, Stationery	6.72	626.38
"	"	"	"	3411	J. B. Lippincott Co.		
					National Formulary IV		331.25
"	21	"	"	3412	Louis C. Hesse		
					Printing, Postage, Stationery		3.25
"	"	"	"	3413	Eschenbach Printing Co.		
					Journal a		101.70

Aug.	24,	Check No.	3414	The Globe Wernicke Co.		
				Printing, Postage, Stationery.....		$ 14.00
Sept.	1	"	" 3415	M. E. McCaffrey		
				Special A. Ph. A. Research.....		250.00
"	10	"	" 3416	Wm. B. Day		
				Printing, Postage, Stationery.....	$ 78.00	
				Clerical.....	32.00	
				Membership.....	44.56	
				Year Book.....	21.00	175.56
"	"	"	" 3417	George M. Beringer		
				National Formulary V.....		12.26
"	"	"	" 3418	E. Fullerton Cook		
				National Formulary V.....		14.09
"	"	"	" 3419	Frank Hillig		
				Printing, Postage, Stationery.....		4.00
"	"	"	" 3420	Garrett Buchanan Co.		
				National Formulary V.....		4.50
"	11	"	" 3421	Burroughs Adding Machine		
				Special Adding Machine.....		196.00
"	"	"	" 3422	Eschenbach Printing Co.		
				Journal a.....		667.05
"	"	"	" 3423	Heber W. Youngken		
				Special A. Ph. A. Research.....		200.00
"	"	"	" 3424	Wm. B. Day		
				Printing, Postage, Stationery.....	14.00	
				Membership.....	10.00	24.00
"	"	"	" 3425	E. G. Eberle		
				Salaries.....	312.50	
				Journal a.....	7.18	
				" b.....	62.00	
				" c.....	14.49	396.17
"	25	"	" 3426	W. T. Robinson		
				Printing, Postage, Stationery.....	66.00	
				Miscellaneous.....	11.00	
				Membership.....	31.50	
				Printing, Postage, Stationery.....	52.50	
				Miscellaneous.....	1.50	
				Membership.....	17.50	170.00
"	"	"	" 3427	H. M. Whelpley		
				Printing, Postage, Stationery.....	117.29	
				Miscellaneous.....	14.71	
				Clerical Exp. for Treas.....	250.00	382.00
"	"	"	" 3428	E. Fullerton Cook		
				National Formulary V.....		13.72
Oct.	15	"	" 3429	E. G. Eberle		
				Salaries.....	312.50	
				Journal a.....	43.91	
				" b.....	62.00	
				" c.....	7.76	
				" d.....	119.16	545.33
"	19	"	" 3430	A. G. DuMez		
				Printing, Postage, Stationery.....		15.50

Oct.	19,	Check No.		3431	E. N. Gathercoal Membership Committee		$ 37.00
"	"	"	"	3432	Eschenbach Printing Co. Journal a		586.69
"	"	"	"	3433	C. L. Eddy World War Vet. Section		21.24
"	20	"	"	3434	Louis C. Hesse Printing, Postage, Stationery		19.25
"	"	"	"	3435	W. T. Robinson Printing, Postage, Stationery		13.50
Nov.	8	"	"	3436	Robert P. Fischelis, Sec. Treas. Drug Trade B. of Pub. Infor.		200.00
"	"	"	"	3437	J. B. Lippincott National Formulary IV		720.00
"	"	"	"	3438	Wm. B. Day Clerical	$ 72.00	
					Year Book	22.43	
					Miscellaneous	2.62	
					Printing, Postage, Stationery	7.50	104.55
"	13	"	"	3439	E. G. Eberle Salaries	312.50	
					Journal b	82.00	
					" c	9.25	
					" d	72.68	476.43
"	"	"	"	3440	Eschenbach Printing Co. Journal a		649.36
"	27	"	"	3441	American Trust Co. Miscellaneous		5.00
Dec.	2	"	"	3442	W. T. Robinson Membership		17.50
"	"	"	"	3443	Fidelity & Deposit Co. of Md. Premium on Treas. Bonds		62.50
"	4	"	"	3444	Louis C. Hesse National Formulary IV		12.75
"	"	"	"	3445	W. T. Robinson Membership Committee		45.50
"	8	"	"	3446	Wm. B. Day Printing, Postage, Stationery	10.00	
					Clerical	32.00	
					Year Book	.56	42.56
"	"	"	"	3447	J. B. Lippincott Co. National Formulary IV		307.50
"	9	"	"	3448	E. G. Eberle Salaries	312.50	
					Journal a	20.19	
					" b	74.00	
					" c	20.75	
					" d	51.22	478.66
"	"	"	"	3449	Eschenbach Printing Co. Journal a	25.51	
					" a	592.21	617.72
"	11	"	"	3450	American Metric Assn. Miscellaneous		10.00

Dec.	13,	Check No.	3451	Louis C. Hesse		
				Printing, Postage, Stationery		$ 20.75
"	18	"	3452	John C. Wallace		
				Nat. Drug Trade Conf.		61.55
"	24	"	3453	A. G. DuMez		
				Salaries	$150.00	
				Printing, Postage, Stationery	12.75	162.75
"	"	"	3454	Wm. B. Day		
				Salaries	375.00	
				Clerical	32.00	
				Miscellaneous	.10	407.10
"	27	"	3455	Louis C. Hesse		
				Printing, Postage, Stationery		12.75
"	"	"	3456	H. M. Whelpley		
				Salaries	500.00	
				Printing, Postage, Stationery	2.41	
				Miscellaneous	4.35	506.76
"	31	"	3457	E. G. Eberle		
				Salaries		312.50
"	"	"	3458	H. V. Arny		
				Salaries	300.00	
				Year Book	19.68	319.68
TOTAL						$32,195.44

SUMMARY OF DISBURSEMENTS

By Voucher Check from January 1, 1920, to January 1, 1921.

Printing, Postage & Stationery	$ 1,158.38
Salaries (E. G. Eberle)	6,712.50
Clerical (Wm. B. Day)	448.00
Clerical (Treasurer)	250.00
Miscellaneous	180.38
Stenographers	243.35
Traveling Expenses	632.66
Premium on Treasurer's Bonds	62.50
Auditing Treasurer's Accts.	75.00
Badges and Bars	39.38
Special Adding Machine	196.00
Receipt Book	1.40
Year Book	5,115.77
World War Veteran's Section	562.81
Section on Pract. Pharm. & Desp	27.13
Scientific Section	16.75
Women's Section	5.76
Commercial Section	25.08
Historical Section	6.50
Section on Education & Legislation	25.29
Drug Trade Board of Public Information	214.00
National Drug Trade Conference	61.55
National Syllabus Committee	25.00
Committee on Membership	446.54

Journal a (Publication)	$ 8,602.83		
Journal b (Clerical)	838.95		
Journal c (Printing, Postage, Stationery)	240.05		
Journal d (Freight, Drayage, Miscellaneous)	589.53	$10,271.36	
Formulary V		1,000.33	$27,803.42
Forward		$27,803.42	
National Formulary (Printing, Binding)	$ 1,600.25		
Half Overhead Expense from the National Formulary	2,226.77		
Remington Honor Medal (J. U. Lloyd)	35.00		
Ebert Prize (A. Viehover, Geo. D. Beal)	80.00		
Research Work (N. E. McCaffrey, N. W. Youngken)	450.00	$ 4,392.02	

INVESTED FOR AND TRANSFERRED TO FUNDS

Life Membership Fund	$ 1,214.20		
Centennial Fund	134.34		
Endowment Fund	345.33		
Ebert Prize Fund	53.19		
Proctor Monument Fund	417.55		
Ebert Legacy Fund	197.63		
Research Fund	2,857.56		
Remington Honor Medal Fund	267.98		
General Fund	547.95	$ 6,035.73	$38,231.17
Balance in International Bank, Jan. 1, 1921			6,535.68
Grand Total			$44,766.85

APPROPRIATIONS AND DISBURSEMENTS

	Appropriations	Disbursements
Salaries	$ 6,650.00	$ 6,712.50
Printing, Postage, Stationery	1,300.00	1,158.38
Clerical Expense (Wm. B. Day)	416.00	448.00
Clerical Expense (Treasurer)	250.00	250.00
Miscellaneous Expense	300.00	180.38
Stenographers	350.00	243.35
Traveling Expenses	650.00	632.66
Committee on Membership	500.00	446.54
Premium on Treasurer's Bonds	62.50	62.50
Auditing Treasurer's Books	60.00	75.00
National Drug Trade Conference	200.00	61.55
Section on Scientific Papers	25.00	16.75
Section on Education & Legislation	25.00	25.29
Section on Commercial Interests	25.00	25.08
Section on Practical Pharmacy & Desp	25.00	27.13
Section on Historical Pharmacy	25.00	6.50
Women's Section	50.00	5.76
National Syllabus Committee	25.00	25.00
Committee on Receipt Book	50.00	1.40
World War Veteran's Section	575.69	511.24
Badges and Bars	50.00	39.38
Special Ebert Prize	80.00	80.00
Remington Honor Medal Fund	35.00	35.00

Drug Trade Board of Public Information	$ 200.00	$ 214.00
Special Burroughs Adding Machine	200.00	196.00
Special A. Ph. A. Research Work	450.00	450.00
National Formulary V	1,000.00	1,000.33
Year Book	5,100.00	5,115.77
	18,679.19	$18,045.49

THE ASSOCIATION ASSETS, JANUARY 1, 1921

St. Louis City 4% Bonds	$10,000.00	
Boston Penny Savings Bank	15,547.95	
Cash in International Bank	4,514.84	
Soldier and Sailor Fund	456.12	$30,518.91
National Formulary IV (to be transferred to the A. Ph. A. Research Fund)		2,020.84
Permanent Funds		60,739.46
Funds Held in Trust		11,297.48
		$104,576.69

A. PH. A. LIFE MEMBERSHIP FUND (Established 1870)

January 1, 1920 Massachusetts State Registered 3% Bonds		$13,000.00	
January 1, 1920 4th 4¼% U. S. Liberty Bonds		11,800.00	
January 1, 1920 Total Bonds			$24,800.00
January 1, 1920 Cash in International Bank	$ 45.08		
Interest on Mass. State Bonds	390.00		
Interest on U. S. Liberty Bonds	510.05		
Interest on Deposit in International Bank of St. Louis	14.15		
Life Membership Fee—			
J. W. England $25.00			
Paul L. Hess 25.00			
M. H. Potter 50.00			
Wm. A. Frost 25.00			
E. A. F. Borucki 100.00			
E. G. Eberle 25.00			
James H. Beal 25.00			
Wm. B. Day 25.00	300.00	1,259.28	
Invested in U. S. Liberty Bonds		183.62	
Balance in International Bank of St. Louis			1,075.66
4th U. S. Liberty Bonds (Face Value)			200.00
Total on Hand January 1, 1921			$26,075.66

A. PH. A. EBERT PRIZE FUND (Established 1873)

January 1, 1920 4th 4¼% U. S. Liberty Bonds		$ 1,200.00
January 1, 1920 Boston Penny Savings Bank	$ 34.36	
Interest on Boston Penny Savings Bank	1.65	
Balance in Boston Penny Savings Bank		36.01
January 1, 1920 International Bank of St. Louis	54.85	

Interest on U. S. Liberty Bonds	$50.95		
Interest on Deposit International Bank	.59	$106.39	
1919 Award, Arno Viehover	$40.00		
1920 Award, Geo. D. Beal	40.00	80.00	
Balance in International Bank			$ 26.39
Total on Hand January 1, 1921			$ 1,262.40

A. PH. A. CENTENNIAL FUND (Established 1877)

January 1, 1920 Massachusetts State Reg. 3% Bond			$ 1,000.00
January 1, 1920 4th 4¼% U. S. Liberty Bonds			2,400.00
January 1, 1920 International Bank of St. Louis	$ 23.51		
Interest on Massachusetts State Bonds	30.00		
Interest on U. S. Liberty Bonds	102.00		
Interest on Deposit in International Bank	2.34		
Balance in International Bank			157.85
Total on Hand, January 1, 1921			$ 3,557.85

A. PH. A. ENDOWMENT FUND (Established 1906)

January 1, 1920 4th 4¼% U. S. Liberty Bonds			$ 8,000.00
January 1, 1920 Boston Penny Savings Bank		$ 6.88	
Interest on Boston Penny Savings Bank		.32	
Balance in Boston Penny Savings Bank			7.20
January 1, 1920 International Bank of St. Louis		33.16	
Interest on Deposit in International Bank		4.99	
Interest on U. S. Liberty Bonds		340.02	
Balance in International Bank			378.17
Total on Hand, January 1, 1921			$ 8,385.37

A. PH. A. EBERT LEGACY FUND (Established 1909)

January 1, 1920 St. Louis Public Improvement Gold Bonds			$ 2,000.00
January 1, 1920 2nd Converted 4¼% U. S. Liberty Bonds			2,000.00
January 1, 1920 4th 4¼% U. S. Liberty Bonds			700.00
January 1, 1920 International Bank of St. Louis		$ 25.69	
Interest on St. Louis Bonds		80.00	
Interest on U. S. Liberty Bonds		114.75	
Interest on Deposit in International Bank		2.88	
Balance in International Bank			223.32
Total On Hand, January 1, 1921			$ 4,923.32

A. PH. A. RESEARCH FUND
(Established 1917)

January 1, 1920 2nd Converted 4¼% U. S. Liberty Bonds			$ 5,000.00
January 1, 1920 4th 4¼% U. S. Liberty Bonds.			9,100.00
January 1, 1920 International Bank of St. Louis	$ 27.30		
Interest on U. S. Liberty Bonds	589.25		
Interest on Deposit in International Bk.	31.54		
Balance from Overhead Exp. of N. F. IV.	2,226.77		
Total in International Bank		$ 2,884.86	
Paid for Research Work			
N. E. McCaffrey	$ 250.00		
H. W. Youngken	200.00		
Total Disbursed for Research Work		450.00	
Balance in International Bank			$ 2,434.86
Total on Hand January 1, 1921			$16,534.86

A. PH. A. PROCTER MONUMENT FUND
(Established 1904)
(Established 1904)
Held In Trust

January 1, 1920 2nd Converted 4¼% U. S. Liberty Bonds			$ 8,000.00
January 1, 1920 4th 4¼% U. S. Liberty Bonds.			1,700.00
January 1, 1920 International Bank of St. Louis		$ 22.89	
Interest on U. S. Liberty Bonds			
Interest on U. S. Liberty Bonds		412.25	
Interest on Deposit in International Bank.		5.30	
Balance in International Bank			440.44
Total On Hand January 1, 1921			$10,140.44

A. PH. A. REMINGTON HONOR MEDAL FUND
(Established 1918)
Held In Trust

January 1, 1920 3rd 4½% U. S. Liberty Bonds.			$ 1,000.00
January 1, 1920 International Bank of St. Louis	$ 42.68		
Hugo Schaefer Chairman N. Y. Entertainment	93.09		
Interest on U. S. Liberty Bonds	46.75		
Interest on Deposit in International Bank.	1.33	$ 183.85	
Invested in U. S. Liberty Bonds	$ 91.81		
Honor Medal for J. U. Lloyd	35.00	126.81	
Balance in International Bank			57.04
4th U. S. Liberty Bonds (Face Value)			100.00
Total on Hand January 1, 1921			$ 1,157.04

A. PH. A. SOLDIER AND SAILOR FUND
(Established in 1918)

Contributions received to January 1, 1921	$ 2,080.05	
Interest on deposit on International Bank	34.32	
Total receipts to January 1, 1921		$ 2,114.37
Disbursed by check to January 1, 1921	1,647.00	
Bank exchange	11.25	
Total disbursement to January 1, 1921		1,658.25
Balance on hand in International Bank of St. Louis January 1, 1921	$ 456.12	

THE A. PH. A. PERMANENT FUNDS
January 1, 1921

	Jan. 1, 1921	Jan. 1, 1920	Increase
Life Membership Fund	$26,075.66	$24,845.08	$ 1,230.58
Ebert Prize Fund	1,262.40	1,289.21	26.81F
Centennial Fund	3,557.85	3,423.51	134.34,
Endowment Fund	8,385.37	8,040.04	345.33
Ebert Legacy Fund	4,923.32	4,725.69	197.63
Research Fund	16,534.86	14,127.30	2,407.56
	$60,739.46	$56,450.83	$4,288.63

FUNDS HELD IN TRUST BY THE A. PH. A.

	Jan. 1, 1921	Jan. 1, 1920	Increase
Procter Monument Fund	$10,140.44	$ 9,722.89	$ 417.55
Remington Honor Medal Fund	1,157.04	1,042.68	114.36
	$11,297.48	$10,765.57	$ 531.91

TOTAL FUNDS

		Jan. 1, 1921	Jan. 1, 1920	Increase
Permanent Funds		$60,739.46	$56,450.83	$ 4,288.63
Trust		11,297.48	10,765.57	531.91
General Fund	$25,547.95			
Current Account	4,514.84			
Soldier and Sailor Fund	456.12	30,518.91	29,567.08	951.83
½ Net Profit National Formulary		2,020.84	2,226.77	205.93F
		$104,576.69	$99,010.25	5,566.44

(F decrease)

The report of the public certified accountants, Jeff. K. Stone & Co., of St. Louis, is dated April 26, 1921. It covers the above records for 1920. This report was published on page 550 of the Journal of the American Pharmaceutical Association for July, 1921. An abstract of the records was printed in the same issue of the Journal.

The report of the treasurer is published in full in the Year-Book, in accordance with the action of the Council, which is recorded in the Journal for July, 1920 (page 726).

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REPORT

ON THE

PROGRESS OF PHARMACY

1920

By HENRY V. ARNY

WITH THE COLLABORATION OF

CHARLES W. BALLARD
LINWOOD H. BROWN
LEWIS N. BROWN
KARL S. BURKETT
ZADA M. COOPER
MAY O'C. DAVIS
GEORGE C. DIEKMAN
HERMANN ENGELHARDT
ROBERT P. FISCHELIS
EDMUND N. GATHERCOAL
IVOR GRIFFITH
FANCHON HART
JEANNOT HOSTMANN
HENRY A. LANGENHAN
HAROLD McADAMS
JOSEPH L. MAYER
OTTO E. MUHLHAN
WILLIAM A. PUCKNER
HUGO H. SCHAEFER
CLYDE M. SNOW
JOHN K. THUM
JOHN M. WILLIAMS
CURT P. WIMMER
HEBER W. YOUNGKEN

INTRODUCTORY

This 1920 report is more complete than any published since the beginning of the Great War, as the Reporter and his collaborators have had access to a number of European journals that were not available during the war period. Hence a larger number of the abstracts in this issue have been prepared from primary sources than has been possible since 1914.

NEW YORK, August 10, 1921.

PHARMACY

A—GENERAL SUBJECTS

PHARMACOPŒIAS AND FORMULARIES.

United States Pharmacopœia.—*Revision Problems.*—In a symposium on this subject, the following subjects were discussed:

Establish central laboratory; have fewer members on revision committee. Dr. Harvey W. Wiley.

Admit certain synthetic drugs and simplify names of official ones. Dr. Horatio C. Wood, Jr.

Certain compromises are necessary in matter of deletions. J. M. Francis.

Suggestions in regard to the microanalysis of drugs. Dr. Albert Schneider.

Attention called to a number of important points. A. B. Lyons.

Have a standing committee. Prof. L. E. Sayre.

Problems arising from national prohibition. How to interest the physicians. Wm. B. Day.

Need for a settled policy in botanical nomenclature. Oliver Atkins Farwell.

Physiologic tests for certain of the more potent drugs. Dr. Wm. A. Pearson.

Size of committee; deletions; patents; outline of work for committee. Dr. Torald Sollman.

Lemonpeel and nutmegs. Dr. O. T. Osborne.

The most perplexing problem is what to include and what to exclude. C. F. Nixon.

For details, the original papers should be consulted.—Drug. Circ., 64 (1920), 85. (L. N. B.)

United States Pharmacopœia.—*Expediting Revision of.*—H. V. Arny presents in detail the following views which he terms as purely personal opinions of one who has had a privilege of serving on the committee of revision:

1. Lack of money; 2. Superabundance of counsellors; 3. Unnecessary discussion; 4. Cumbersome voting methods; 5. Shortage of paid help; 6. Unnecessary research during revision.

The author also offers suggestions in detail, for the correction of the above views. Drug. Circ., 64 (1920), 129. (L. N. B.)

United States Pharmacopœia.—*Revision of Monographs of Chemicals.*—H. V. Arny directs attention to the importance of correct wording of the text of official chemicals because of their frequent use by attorneys who are attempting to get clients out of tight places when their products are being subjected to the scrutiny of the law. Cases are cited which illustrate the quibbling that is possible where language is not very explicit.

"Faint turbidity" tests cause difference of opinion and consequent difficulties in drug litigations. In a study made for the sub-committee on inorganic chemicals sensitivity of the following were established: silver nitrate for chlorides, barium chloride for sulphates, magnesium mixture for phosphates, ammonium molybdate for phosphates and potassium sulphate for barium. Then limits of impurity were determined for 25 commercial chemicals for which "faint turbidity" tests are provided. The conclusions have warranted the sub-committee in recommending more precise turbidity tests.

Dr. Arny suggests that attention be given to less expensive "shaking out" solvents than chloroform. He has found that the polarimetric assay of camphorated oil requires too large a sample and consumes too much time and that the evaporation method of the German and Swiss pharmacopœias is satisfactory. The official assay for calomel tablets is unsatisfactory because of the slow solubility of calomel in tenth-normal iodine solution. If 0.5 Gm. be directed in place of 1 Gm. no difficulty will be experienced. Solution of magnesium citrate should be assayed for magnesium oxide and citric acid. For the latter the method suggested by J. L. Mayer (See page 106) is satisfactory. J. Am. Pharm. Assoc. 9 (1920), 971. (Z. M. C.)

United States Pharmacopœia.—*Standards for Botanic Drugs of.*—C. W. Ballard directs attention to the fact that there should be some means of governing standards of botanical drugs which are deleted at each pharmacopœial revision but which do not immediately pass out of use. Rulings similar to those published by the Bureau of Chemistry have the advantage of elasticity and may be changed or added to at any time. Dr. Ballard makes

a number of suggestions touching especially on the "legal aspect" of certain pharmacopœial statements. Definite botanical origin should be stated, the phrase, "and other species" permitting substitution or sophistication. Adoption of standard terminology in microscopical descriptions of plant tissues should be made possible by the agreement upon some such standard by the proper scientific bodies. Such a movement might be started by the Scientific Section of the A. Ph. A. Where unofficial parts of plants are likely to be present, description of such parts should be given.

Diagnostic characters in microscopical descriptions should be indicated. Indication of possible adulterants would be of value to the student but they also furnish information to the dealer who would practice sophistication and it creates doubt in the legal mind of the seriousness of the offense if some other adulterant of the usually large number is used rather than those specified. There should be a standard for fineness of powder used in description because of the great structural differences which are apparent in different powders. A "description of the technic of mould examinations would give official recognition to this method of detecting spoilage." A moisture limit for crude drugs should be established.—J. Am. Pharm. Assoc. 9 (1920), 676. (Z. M. C.)

United States Pharmacopœia.—*Assay Processes of.*—Frantz F. Berg believes that the Pharmacopœia would be better suited to the use of analysts in chemical laboratories if alternative methods were given as well as the methods designed to meet the needs of pharmacists. Assay processes should be given for some preparations which do not now have them but by law are required to meet certain standards. He would include an assay for ammonia content, in the aromatic spirit of ammonia, water in compound cresol, filicic acid in oleoresin of aspidium and an assay for hexamethylenamine. He has found neutral asbestos fiber better than oak sawdust in assaying fluidextracts of ipecac and cinchona. Care as to temperature is necessary with ipecac for the alkaloids are liable to decompose. The correct melting point of cocaine hydrochloride should be determined and an assay process established. The present pharmacopœial statement of the solubility of cresol seem to be incorrect. The present method

of detecting methyl alcohol in ethyl alcohol should be revised or superceded by a better one. In assaying opium and its preparations an alundum or Gooch crucible is better for collecting morphine crystals than either cotton or filter paper.—J. Am. Pharm. Assoc., 9 (1920), 772. (Z. M. C.)

United States Pharmacopœia.—*Suggested Deletions.*—A. R. Bliss, Jr., contends that "the real worth, the absolute value of a substance as a medical agent should be proved, such proof recognized, and the real practical value further proved by extensive use before it is admitted to the U. S. P. and all substances now in the Pharmacopœia that do not meet these requirements should be deleted." Dr. Bliss submitted to the 513 physicians of Atlanta a list of 121 U. S. P. vegetable drugs asking them to indicate those that should be deleted together with reasons for doing so. 387 responded and it was found that 30 drugs would not be deleted by anyone. A tabulation of the remainder accompanied by the percentage that believe they should be deleted is given. 31 drugs are recommended for deletion by 50 per cent or more of the physicians and of these 31 only one appears in the book "Useful Drugs" of the American Medical Association. In addition to this 31, Dr. Bliss gives a number that in his opinion should be deleted.—J. Am. Pharm. Assoc., 9 (1920), 767. (Z. M. C.)

United States Pharmacopœia.—*Revision Suggestions.*—Paul Caldwell comments both favorably and otherwise on approximately 100 monographs of U. S. P. IX; in regard to their service and usefulness and need in U. S. P. X.—Pract. Drug., 39 (Apr., 1920), 23. (H. M.)

United States Pharmacopœia—*Co-operation in Revision of.*—E. Fullerton Cook believes that the very nature of the publication enlists the co-operation of all associated sciences. The personality of the chairman has had much influence; for upon the chairman depends the effectiveness of co-operation. The machinery of revision will govern the amount of co-operation available. Every interest in the United States seems to desire to give the best service. How well men and equipment may be utilized depends on the judgment, tact and organizing ability of the chairman.—J. Am. Pharm. Assoc., 9 (1920), 403. (Z. M. C.)

United States Pharmacopœia.—*Machinery for Revising the.*—E. F. Cook tells in detail how the revision committee was organized by the chairman with the object always in view of creating a machine that would work harmoniously and effectively. The writer states that in the coming revision it would be well to so arrange that there be an increased number of personal conferences between the members of the revision committee. Conferences would undoubtedly make for more rapid progress and enable the committee to place the result of their labors before the profession in a shorter time than has heretofore been the case.—Am. J. Pharm., 92 (1920), 304. (J. K. T.)

United States Pharmacopœia.—*Saving Time in Revising.*—Jacob Diner suggests that each committee should begin its work immediately after the publication of the U. S. P. Organization is a vital matter. Chairmen of committees should be the most able men in the country; efficiency should not be hampered by the expediency of having committee members close together geographically. Members of committees should be men who can do the work scientifically for the satisfaction of the deed, not because of its advertising value.—J. Am. Pharm. Assoc., 9 (1920), 200. (Z. M. C.)

United States Pharmacopœia.—*Revision Suggestions.*—Jacob Diner suggests that since the Pharmacopœia is a scientific book of standards, the following compound preparations be deleted from it and be incorporated in the National Formulary;—Creosote Water, Cantharides Cerate, Compound Infusion of Senna, Compound Glycyrrhiza Mixture, Aromatic Spirit of Ammonia, Compound Powder of Glycyrrhiza, Compound Spirit of Juniper, Compound Syrup of Sarsaparilla and the various troches. Since international standards have been adopted for the preparations containing potent drugs, Dr. Diner suggests the following formula for Camphorated Tincture of Opium:—

Tincture of Opium	50 mils
Benzoic Acid	5 Gm.
Camphor	5 Gm.
Oil of Anise	5 mils
Diluted Alcohol to make	1000 mils

J. Am. Pharm. Assoc., 9 (1920), 493. (M. O'C. D.)

United States Pharmacopœia.—*The Scientific Side of Revision.*—A. R. L. Dohme suggests that instead of a committee of fifty or even twenty-five, there should be a committee of three who would be given power to name experts and assistants who will devote all their time to the work and be amply paid. He further suggests an advisory board of ten who will be subject to the call of the committee and who will serve with no pay except expenses. A complete library on scientific work pertaining to the Pharmacopœia should be available with a librarian in charge who would also collect and classify current literature. Carefully thought out plans for every department should be put into operation. A small committee could work in one research laboratory instead of in scattered ones.—J. Am. Pharm. Assoc., 9 (1920), 279 and 400. (Z. M. C.)

United States Pharmacopœia.—*Who Shall Do the Work of Revision?*—Robert P. Fischelis believes that no government bureau or scientific foundation laboratory could maintain a policy to thoroughly democratic as the revision committees that are representative of every interest.—J. Am. Pharm. Assoc., 9 (1920), 198. (Z. M. C.)

United States Pharmacopœia.—*Suggested Changes in the Monographs for Vegetable Drugs.*—E. N. Gathercoal discusses the scope, if the new U. S. P. is to be similar to the present one as well as if it is to become an exclusive book of standards. Names should be little changed but should conform to botanical authorities if possible. Drug definition should be as simple as it can be and be of value legally. Amplification of the preservation rubric is suggested. Physical characters should be limited to essentials. Tests should be continued. Mr. Gathercoal expresses approval of suggestions made by Dr. Rusby, Dr. Francis and Prof. Day.—J. Am. Pharm. Assoc., 9 (1920), 700. (Z. M. C.)

United States Pharmacopœia.—*Revised Suggestions.*—At a meeting of the New York Branch of the American Pharmaceutical Association, R. R. Gerstner suggested that the more stable petroleum products be employed instead of the present animal or vegetable bases in the following official galenicals.

Zinc Oxide Ointment:—Petrolatum can be used to advantage

in this ointment, since it is the astringency of the powdered zinc oxide and not the base, that is sought.

Phenol Ointment:—This ointment acts as an external antiseptic; when made with a petrolatum base, it can be sterilized without deterioration.

Iodine Ointment:—Petrolatum mixed with readily absorbable wool-fat gives a very satisfactory base for this ointment because it is oftentimes used for skin absorption: this mixture overcomes the disadvantage of having an ointment whose value of free iodine is usually below standard, due to the iodization of the lard.

Sulphur, Tar and similar Ointments:—Petrolatum acts as a good vehicle and protective agent for these antiseptic and germicidal agents.

Camphorated Oil:—Mr. Gerstner suggests that a weaker camphor liniment, with mineral oil as a base be made official along with the present 20 per cent. vegetable base liniment of camphor.—J. Am. Pharm. Assoc., 9 (1920), 491. (M. O'C. D.)

United States Pharmacopœia.—*Revision Suggestions.*—William Gray shows why he believes corn oil should be used in soft soap; why compound solution of cresol should be made by using equal weights of cresol and soft soap; why the base in zinc oxide ointment should be petrolatum; why the Pharmacopœia should include both chemically pure and commercial glucose; why whisky, brandy, gin, and rum should be added to the Pharmacopœia; why the book should contain a 15 per cent. solution of chlorinated lime.—J. Am. Pharm. Assoc., 9 (1920), 1086. (Z. M. C.)

United States Pharmacopœia.—*Recognition of Alcohol in.*—Henry Kraemer sets forth very plainly the fact that no substitute for alcohol as a solvent and preservative has been found. U. S. P. and N. F. preparations "represent the consummation of the wisdom and experience of the past one hundred years and that it would be very unsafe to abruptly depart from this," though all preparations that are likely to be used as beverages should be eliminated.—J. Am. Pharm. Assoc., 9 (1920), 55. (Z. M. C.)

United States Pharmacopœia.—*Scope of.*—Henry Kraemer discusses this question from two view points, that of including only useful drugs and simple preparations and that of including everything demanded by the medical profession. He believes that definitions must be extended to include additional sources of supply; that the stability of some important drugs and their preparations must have greater consideration; that physiological assays should have careful revision; that the value of the phenol coefficient in indicating germicidal activity should be acknowledged. Finally he submits a tentative list of additions.—J. Am. Pharm. Assoc., 9 (1920), 196. (Z. M. C.)

United States Pharmacopœia.—*Some Revision Suggestions.*—E. V. Kyser makes some suggestions about the oils that may be used in preparing camphor liniment and ammonia liniment and the soap for soap liniment and compound cresol solution.—J. Am. Pharm. Assoc., 9 (1920), 496. (Z. M. C.)

United States Pharmacopœia.—*Revision Suggestions.*—Robert R. Lampa states there has been a tendency to introduce innovations in previous editions of the U. S. P. and N. F. and entirely too much so. There are, however, no objections to real improvements, that are in the line of progress. In many instances, there is no need to remove household remedies or even try to disguise them, so that the public will not recognize them. Mr. Lampa also comments on some changes and in addition recommends that the ash content of about 20 drugs be changed so as to comply with the drugs that are now obtainable in the market.—Pract. Drug., 39 (Apr., 1920), 22. (H. M.)

United States Pharmacopœia.—*Inorganic Chemicals of.*—C. H. LaWall chooses sodium bicarbonate as a typical inorganic chemical. Study of the text of the Pharmacopœias since the beginning shows that it is simpler now than earlier, that the phraseology has passed from subjunctive to declarative and unnecessary words are omitted. Comparison with leading foreign pharmacopœias indicates that the U. S. P. IX leads them all in comprehensiveness and detail. Yet our text is open to some criticism. The present U. S. P. Sub-committee on Inorganic

Chemicals is trying to make the description of the tests for chlorides and sulphates so explicit that they cannot be misunderstood. Abridgment in the forthcoming book can only be made by increasing the general tests and this might have advantages for users who are not seeking chemical details.—J. Am. Pharm. Assoc., 9 (1920), 679. (Z. M. C.)

United States Pharmacopœia.—*Revision Suggestions.*—H. LaWall submits the abstracts of recommendations made at his request. They are classified under the following heads: methods, historical introduction, preface, botany, scope, additions, deletions and iscellaneous recommendations. Besides these features, many comments on individual substances are arranged in alphabetical order. There is a wealth of information and valuable suggestion in these abstracts which cannot well be further condensed.—J. Am. Pharm. Assoc., 9 (1920), 285, 404. (Z. M. C.)

United States Pharmacopœia.—*Scientific Side of the.*—C. H. LaWall in his discussion of pharmacopœial revision makes two important suggestions: first, the establishment of some system which will make personal conferences possible in order to avoid the delay incident to discussions by mail; second, that the Board of Trustees be authorized to call in experts in different scientific lines since these men may not always be delegates or if so, circumstances may prevent their being present at the Convention.—J. Am. Pharm. Assoc., 9 (1920), 279. (Z. M. C.)

United States Pharmacopœia.—*Scope of Revision.*—C. H. LaWall directs attention to the fact that the Committee on Scope of the U. S. P. IX was the first of its kind. Its personnel was entirely medical, which theoretically was sound policy but actually did not prove good. Study of that committee's workings leads Mr. LaWall to believe that the entire Committee of Revision should be a committee on scope. There should be frequent meetings of heads of sub-committees. This group known as the Executive Committee could submit proposed additions or deletions to the entire committee.—J. Am. Pharm. Assoc., 9 (1920), 195. (Z. M. C.)

United States Pharmacopœia.—*The Revision of.*—C. H. LaWall believes that the numerous criticisms which appear just following the issuing of a new revision of the United States Pharmacopœia, or preceding the decennial convention are signs of healthy interest in our Pharmacopœia, and should be encouraged rather than discouraged. He further points out the complex and difficult task of meeting the demands of those whom it serves as a guide, and declares it to be imperative that both Medicine and Pharmacy send their best representatives to the Conventions.—Drug. Circ., 64 (1920), 49. (L. N. B.)

United States Pharmacopœia.—*Relation of the Chemist to the.*—At a meeting of the Philadelphia Section of the American Chemical Society, C. H. LaWall outlined the history and methods of revision of the Pharmacopœia. He points out that as nearly half of the official substances are chemical, it is obvious that the chemist should and does play an important part in pharmacopœial revision.—J. Ind. Eng. Chem., 12 (1920), 696.

United States Pharmacopœia.—*In Relation to Manufacturing.*—F. W. Nitardy discusses various phases of this question, rather inclining to the opinion that the U. S. P. should continue its policy of setting standards, leaving the individual dealer to decide whether he will do his own manufacturing or buy his pharmaceuticals.—J. Am. Pharm. Assoc., 9 (1920), 889. (Z. M. C.)

United States Pharmacopœia.—*Organic Chemicals of.*—George D. Rosengarten outlines the general principles which governed the revision of organic chemicals of the Pharmacopœia.—J. Am. Pharm. Assoc., 9 (1920), 282. (Z. M. C.)

United States Pharmacopœia.—*Botanical Nomenclature of.*—The American Code of Nomenclature was promulgated by botanists representative of Great Britain, Germany and France; the United States Federal service follows it and so do most of the states; therefore H. H. Rusby reminds us that the U. S. P. should retain it. The International Code is not a code, correctly speaking. That "priority of publication should determine the name of a group or species" is the principle that governs the

so-called American Code. The International would avoid inconvenience in usage by deviating from this rule where conformity would mean changing a large number of names in common use. Dr. Rusby proposed "that some authoritative and representative international body should make a list of excepta, comprising those cases in which the change would cause great inconvenience, and should authorize the current use, in botanical literature, of the incorrect names that have come into common use." However, the Vienna convention was mostly Pan-German, scientific principles were ignored, Pan-German interests being the chief consideration. It would be a serious mistake for our Pharmacopœia to discontinue the present method.—J. Am. Pharm. Assoc., 9 (1920), 670. (Z. M. C.)

United States Pharmacopœia.—*Revision Suggestions.*—H. H. Rusby expresses the opinion that Revision Committees have not profited by investigations made and conclusions reached by preceding committees and suggests that a special sub-committee should prepare an "index to the proceedings of all previous committees and that every question studied should be first studied from their files." He suggests close cooperation between revisors of the U. S. P. and those of the N. F. in order that such things as nomenclature and doses should agree. Certain botanical families need special study and in this connection, Dr. Rusby gives much valuable information. Further he directs attention to the fact that there are many discrepancies in doses of drugs and their preparations and that it is generally recognized that most U. S. P. doses are too small.—J. Am. Pharm. Assoc., 9 (1920), 240. (Z. M. C.)

United States Pharmacopœia.—*Some Peculiarities of.*—W. L. Scoville directs attention to some peculiarities of our Pharmacopœia for which there is no apparent reason for perpetuation except habit. He cites some interesting examples: the making of an adjective out of the Latin for tolu, the persistence of "aloes" when aloe would be consistent particularly since we have done away with "oil of cloves" and "syrup of squills"; the use of asafoetida when either the gum or the powdered form, with their different standards is called for; admitting six varieties

of ginger but limiting the tincture and syrup to one designated species. Another habit which persists is the aging of tincture of ferric chloride. He asks also the reason for milliliter and mil. The numerous questions need time; else hasty conclusions will be reached.—J. Am. Pharm. Assoc., 9 (1920), 280. (Z. M. C.)

United States Pharmacopœia.—*Criticism of Part II.*—Harry L. Thompson directs attention to some features of this part of the Pharmacopœia which he thinks could be improved. The list of chemicals (pages 504 to 519) should not be limited to pharmacopœial ones; logarithmic equivalents should be introduced; elements and atomic weights should not be repeated. Multiples of atomic and molecular weights might be excluded. Temperature standard should be 20° instead of 25° in order to conform to the Government Bureau of Standards and because graduation of volumetric glassware is done at 20°. There should be added methods for calibration of balances, weights, measures and volumetric apparatus with corrections for temperature and pressure; information on the sensibility of the balance under varying loads, the zero point and its determination, testing for equality of arms; the proper method of weighing as well as use and care of the balance. There should be given directions for conversion of weights to vacuo, the limit of error or tolerance in weighing and in calibration of weights. Something should be said about reading burettes since the percentage of error may be considerable if quantities used are small. Normal volumetric solutions, should be 1.008 gramme of hydrogen instead of 1 because the system uses 16 for oxygen. The use of empirical formulas needs elaboration. The number of volumetric solutions might be considerably reduced, by omitting hundredth normal and two hundredth normal and some others. Tenth normal copper sulphate should replace Fehling's and tenth normal barium chloride should be added. Standardization of solutions of any normality should not be done by weighing the solid and diluting to a certain volume or by dilution of a standard solution of different normality. An alphabetical list of chemical equivalents with logarithmic equivalents for each normality would save repetition for individual solutions. General tests would be improved by transferring material from Part I to Part

II, e. g., assays of alkali and alkaline earth hydroxides, carbonates and bicarbonates. More residual titration methods should be used in assaying volatile chemicals. The chapters about powders, percolation and sterilization should be in Part I. Formulas for diagnostical reagents should be added to. Tables of thermometric equivalents are of no real value; tables of boiling points with physical factors and corrections for altitude would be of more value. The tables for reduction of apparent weight to weight in vacuum and the calibration tables for pycnometers and glass-measuring apparatus are too brief.—J. Am. Pharm. Assoc., 9 (1920), 1168. (Z. M. C.)

United States Pharmacopœia.—*Lessening Alcoholic Content of Some Preparations of.*—J. K. Thum submits recipes for aromatic elixir, compound tincture of gentian, tincture of cinchona, compound tincture of cinchona, tincture of aloes, tinture of strophanthus, tincture of hyoscyamus and tincture of physostigma, in which the alcohol content is materially lessened.—J. Am. Pharm. Assoc., 9 (1920), 249. (M. O'C. D.)

United States Pharmacopœia. — *Revision Suggestions.* — P. Henry Utech, in a paper read before the Pennsylvania Pharmaceutical Association meeting suggests a more expeditious return to the old method of making tincture of nux vomica; that is, dissolving the extract in a mixture of alcohol and water.

The suggestion is made to permit the use of petrolatum in making zinc ointment and that this method be given as an alternative process with some distinctive name such as "zinc paste."

The writer believes that circulatory displacement should be the method of procedure in making camphor liniment.

Owing to the increasing popularity of ampul medication, the suggestion is made that the new U. S. P. should have official such medicaments as sterile preparations of camphorated oil, ergot, and sodium cacodylate for hypodermic medication.

On account of their rare use the following drugs are recommended for deletion: aspidosperma, eriodictyon, musk, lactucarium, triticum and salicin.

The inclusion of maximum and minimum doses as well as

doses for animals of various kinds is suggested as making for a more valuable book.

All new formulæ or change in old formulæ should be indicated by some suitable sign.—Proc. Penna. Pharm. Assoc., 43 (1920), 237. (L. S.)

United States Pharmacopœia X.—*Suggestions for.*—J. P. Snyder recommends a number of changes in the monographs of the present pharmacopœia. Among the substances he discusses are, fluid extract of ergot and of ipecac, scammony, styrax, glycerin and paregoric. He also recommends increasing the number of electrolytic tests.—Proc. N. Y. S. Pharm. Assoc., 42 (1920), 206.

United States Pharmacopœia and National Formulary.—*Revision Suggestions.*—P. E. Hommell discusses many botanical chemicals and galenicals advising deletion from or admission to the U. S. P. or N. F. He recommends substituting 80 mils of fluid extract of black haw for the opium in paregoric; also the replacing of tincture of opium in Sun cholera mixture by tincture of viburnum prunifolium.—Proc. N. J. Phar. Assoc., 50 (1920), 39. (J. H.)

Dr. Hommell discusses another list of official substances where changes are advisable.—Pract. Drug., 39 (May, 1920), 23.

United States Pharmacopœia and National Formulary.—*Revision Suggestions.*—J. L. Lascoff says that many of the processes now described in the Pharmacopœia and National Formulary are so complicated that pharmacists are unable to do their own manufacturing and are calling upon the wholesale manufacturers to furnish them with their galenicals. He criticizes from the standpoint of a dispensing pharmacist, such procedure, and suggests that more simple formulas might be easily devised for some of the more frequently dispensed preparations, which would yield products of pharmacopœial quality and thus expedite dispensing operations.—Drug. Circ., 64 (1920), 169. (L. N. B.)

In another paper, Dr. Lascoff urges that "the modus operandi for some galenicals be so simplified that the retail pharmacist will be able to prepare them himself." He suggests a

number of preparations which should be deleted from the National Formulary as well as a number which should be added.—J. Am. Pharm. Assoc., 9 (1920), 597. (Z. M. C.)

National Formulary.—*Revision Suggestions.*—George E. Ewe says that in the matter of admissions to this notable work, "A broad scientific method of accurately ascertaining the need of admiting items is urgently required." He submits a plan with the hope that if put into operation more positive information concerning appropriate admissions into the N. F. will be obtained than is possible through suggestions by individuals or organizations of limited scope. The furtherance of this plan, however, is altogether dependent on the wholehearted support and cooperation of chemical manufacturers, manufacturing pharmacists, collectors and jobbers.—Am. J. Pharm., 92 (1920), 165. (J. K. T.)

National Formulary.—*Revision Suggestions.*—H. M. Faser believes that the National Formulary should include elixir of iron, quinine and strychnine phosphates, elixir of lactated pepsin and elixir of saw palmetto and santal compound and he gives formulas which he has found satisfactory. He suggests that powdered hydrastis be added to liquor antisepticus to give color to it.—J. Am. Pharm. Assoc., 9 (1920), 1088. (Z. M. C.)

National Formulary.—*Scope of.*—In a symposium, J. M. Lloyd, Henry Kraemer, L. E. Sayre, R. A. Kuever, E. R. Jones, Otto Raubenheimer, R. A. Lyman, H. V. Arny, J. W. England, E. H. Wisner, Z. M. Cooper, E. F. Cook, C. B. Jordan, O. A. Farwell, E. Kremers, E. A. Ruddiman, A. Schneider, E. Spease and W. B. Day discuss the Formulary from a number of angles. Seventeen of the writers point out the usefulness of the book.—Bull. Pharm., 34 (1920), 96, 133 and 187.

Pharmacopœia.—*Finnish.*—A new edition of this work presents itself outwardly as the smallest and most handsomely bound of the world's pharmacopœias; a volume of 380 pages. The work itself is in Swedish, the titles being in Latin followed by the Swedish and Finnish equivalents. The introduction con-

tains the general information usually afforded in all Continental pharmacopœias. In addition to a table of maximum doses of official potent drugs for full grown persons, there is a table of maximum doses for full grown animals. The Latin nomenclature adopted differs materially from the style adopted in the British and United States pharmacopœias on the one hand, and that of most Continental works. To show this difference a few examples are illustrated. The appendices include a table of atomic weights, alcohol, acids, and alkalies, with the percentages and corresponding specific gravities. It gives the specific gravity of official solutions at 15°, with the corrections for each degree above or each degree below that temperature; together with a table showing the number of drops per gramme of various official liquids; the optical rotation of essential oils and of camphor; and a list of substances employed in carrying out medical tests, for the examination of urine, stomach contents, blood and stains for bacteriological work.—Pharm. J., 104 (1920), 353. (L. N. B.)

Pharmacopœias.—*Supplement to the French Codex.*—The last edition of the French Pharmacopœia appeared in 1908, and in view of the fact that all remedies not included in the Codex are legally regarded as secret remedies, the increasing number of new compounds which have gained admission to materia medica necessitated legislation as to their status.

For this purpose a Commission was appointed in 1910 who adopted a Supplement to the edition of the Codex in force. This Supplement was ready for publication in August, 1914, but due to the outbreak of the war it was prevented until 1918.

In order to keep the Codex abreast of therapeutic progress, an entirely new course has been decided upon. In future, as soon as a new drug is judged to warrant inclusion in the official materia medica, a publication will appear in the official journal of the Republic and in the Bulletin of the Academy of Medicine, thus indicating its admittance to the list of official remedies.

A description of the style of the monographs in the Supplement is given by using diethylbarbituric acid, fluidextract of red cinchona and antidysenteric serum as examples.—Pharm. J., 105 (1920), 301. (L. N. B.)

Pharmacopœias.—*Potent Syrups of the Codex.*—At the meeting of the Société de Thérapeutique in November last the following resolution was submitted by Dr. L. Désesquelle for discussion, with a view to its being submitted to the Committee for the Revision of the French Pharmacopœia:—"Considering that the strength in active principles of the syrups of aconite, belladonna, and digitalis of the Codex 1908; and of the syrups of hyoscyamus and stramonium of the Codex 1884, is much too high; and that the use of these syrups may occasion accidents; and, further, more, that the formulæ of these syrups are irrational, since they do not, as is the case of other syrups, represent the usual and normal single dose of the drug in 20 grammes of the syrup; it is proposed that the strength of these syrups should be so reduced and rendered uniform; so that 20 grammes of each syrup shall contain 25 centigrammes of the 1:10 tincture of the drug. For the same reasons it is proposed that the dose of 5 milligrammes at present contained in 20 grammes of the syrup of strychnine sulphate of the Codex 1884, which still has legal force, should be reduced to 1 milligramme."—Bull. gen. Ther., through Pharm. J., 104 (1920), 332.

Pharmacopœia.—*Criticisms of German.*—At a meeting of the German Pharmaceutical Association, P. Bohrisch read a paper, suggesting improvements in the monographs on phenol, colloidal silver, benzoin, camphor, yellow wax, spermaceti, oleoresin of male fern, fluid extracts, senna, dried sodium carbonate, sodium salicylate, oil of theobroma, cod liver oil, olive oil, rhubarb, strophanthus, syrup of ferrous iodide, purified storax, tinctures, tincture of opium and phosphorated oil.—Pharm. Ztg., 65 (1920), 212.

Pharmacopœia.—*Norwegian.*—The new Norwegian Pharmacopœia follows the custom of most modern pharmacopœias in using the language of the country in the text and Latin for official titles. The introductory pages are given to explanatory matter: methods of determining melting and boiling points; iodine, saponification, acid and ester indices are briefly described, and also percolation, sterilization, etc.; directions for collecting, drying, storing and comminuting of drugs are given. All medi-

cines must meet pharmacopœial requirements, and those for which an official method for preparation is given must be prepared in a pharmacy.

A weighable residue is designated as an amount exceeding 1 milligramme. Acid designations form the first part of official titles, and the arrangement being alphabetical, the chemicals are grouped accordingly—the bromides, iodides, sulphates, etc. The Latin nomenclature differs from other pharmacopœias, thus —Brometum Kalicum, Chloretum Cocaicum, Sulfas Chinicus.

Forty-one preparations have been deleted from the previous pharmacopœia and eighty-five have been added. Some of the additions follow. "Aetheroleum" is the designation for essential oil; some of the essential oils have been replaced by the principal constituent; hypophosphites have been introduced. Monographs on fluid extracts state the specific gravity, and percentage of dry extract yielded on evaporation. As an emulsifier a mixture of acacia (4), tragacanth (4) and gelatin (1) is employed in cod-liver oil emulsion.—J. Am. Pharm. Assoc., 9 (1920), 926.

EDUCATIONAL PHARMACY

Cram Courses in Pharmacy.—Zada M. Cooper presents some very interesting facts concerning "the correspondence and resident schools" whose sole object is "to get the student by the Board." Legislation is being introduced in every State forcing them out of existence, and the persons conducting these "courses" know that they cannot last much longer, in fact their literature tell the tale.

Persons taken in by these courses, usually lack proper training and upon obtaining their licenses are foisted upon an innocent public, where they compete with real pharmacists, thus keeping salaries down, and in many instances "have operated 'booze joints' under the guise of pharmacies."

The promises of these courses are alluring in that their claims are (1) they do not interfere with regular work, (2) no experience necessary to take the course. The course usually consists of 24 lectures, one each week and they cover all of the required branches of pharmacy. Upon completion of the course, the degree granted usually is contingent upon the ability of the

person to obtain his license. Degrees, other than Ph.G. are granted, for "post-graduate" work, the requirement usually is that the student must submit a thesis varying from 5,000 to 20,000 words, depending upon the degree desired.

The costs of these courses are high in comparison to regular college fees, but the student usually continues the course until he or she is able to pass the Board.—Drug. Circ., 64 (1920), 401. (H. M.)

Educational Problems.—Henry P. Hynson believes that the high school student who intends to become a pharmacist should substitute the last two years of high school work for two years of preliminary pharmaceutical training which would have the same equivalent valuation.

This two years of preliminary training should be at least along the following lines:

Penmanship, including label writing and package marking, also use of typewriters.

Correspondence, commercial and technical.

Bookkeeping and commercial forms.

Mathematics, including every form of calculation applicable to pharmaceutical or chemical work, and accounting, including insurance, taxes and providing estimates.

Latin. A course that will make the knowledge gained applicable to the drug business.

Elementary physics.

Care and use of body. Thorough training in the special use of eyes and hands.

The manual training, besides the usual mechanical operations, should include the simple rolling and finishing pills, folding powder papers, filling capsules, sealing konseals and the handling and cleaning of apparatus.

This would enable the student to obtain greater knowledge in the laboratory courses, especially in dispensing. Also this preliminary training would partially substitute the "old time drug store experience" now unobtainable. Upon this course a more elaborate and comprehensive pharmaceutical course could be given thus producing a very thoroughly and capable trained person.—Am. Drug., May (1920), 20. (H. M.)

Educational Requirements.—*Fourteen States Now Require Collegiate Training.*—C. J. Jordan points out that prior to January 1, 1915, only five states demanded collegiate training of their licentiates, while today fourteen states, namely,—Illinois, Indiana, Iowa, Minnesota, New Jersey, New York, South Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Virginia and Washington require graduation from college for permission to appear before the State Board of Pharmacy.—Drug. Circ., 64 (1920), 89. (L. N. B.)

Educational Standards.—*Improving.*—R. A. Lyman says that if Pharmacy is to keep pace with the other related professions, certain steps are necessary. The first change is in the educational requirements. Now that the four year high school requirement is about to become effective, the next step is to be considered: in this connection he believes that a four year technical college course should be required. Another matter of equal importance is that of apprenticeship. He believes that this system is responsible for turning away from pharmacy many intelligent young men. He speaks also of standardization schools—classifying the colleges of pharmacy, their methods of instruction. Of the utmost importance is having men of broad training; wide interests can place pharmacy in a commanding position. With men of this type at the head of our colleges the methods of teaching would also be improved. He also states that a very serious problem is the lack of adequate journals and text books. And the last step in advancing the profession of pharmacy is the betterment of pharmaceutical standards. He believes it is a mistake to continue the National Formulary with its present policy, but that it could be so changed as to become a real factor in the advancement of scientific pharmacy.—Drug. Circ., 64 (1920), 127. (J. M. W.)

Educational Standards.—*Improving.*—W. F. Rudd states that the present standards of pharmaceutical educational requirements are inadequate. However, the State Boards and Colleges are now co-operating in an effort to advance the standards as readily as possible. In many instances, the colleges will have to have a complete reorganization to comply with these requirements.—Drug. Circ., 64 (1920), 15. (H. M.)

Educational Standards.—*Improving.*—F. J. Wulling states that a need for more adequate education foundations is being recognized in all lines. The vocational schools so recently established point to the fact that the trades feel the need of systematic and collective training. The world of business also desires this and as a result many universities have established colleges of business, differing of course from the lower and secondary colleges of typewriting, accounting, etc.,, which have long been with us. If Pharmacy is to keep up with the procession, it too must awaken and develop. The first impetus given to pharmacy was the establishing of the Philadelphia College of Pharmacy in 1821. This system of education soon proved to be superior to the apprenticeship system. Pharmacy college prerequisite laws are increasing. He refers to the progress of Minnesota in this respect and gives a short history of its work, stating that the Minnesota State Pharmaceutical Association unanimously adopted a resolution calling for a minimum of four years' University work in the College of Pharmacy.—Am. Drug. (Aug. 1920), 35. (J. M. W.)

Laboratory.—*The Montpellier Galenical*—Astruc describes this laboratory pointing out that one typical machine for each operation has been selected and installed, so that students may come to know the apparatus necessary to manufacture on a large scale, such galenicals as perles, tablets, granules, extracts, powders, pastilles. In order that the student may get acquainted with these operations the machinery is continually manufacturing these galenicals. The pharmacy school at Paris has expensive museums, a library of over forty thousand volumes, eight large chemical laboratories, two physical laboratories, four micrographical laboratories and a large bacteriological department having an adjacent laboratory for delicate, dangerous work; all these laboratories are well fitted for their various purposes. Research laboratories reserved for the professors and their staff and also for students preparing for higher examinations, are attached to each department.—J. Am. Pharm. Assoc., 9 (1920), 456. (M. O'C. D.)

Pharmaceutical Research.—*A Public Service.*—In an address

delivered before the Pennsylvania Pharmaceutical Association, H. V. Arny cites the research achievements of 47 pharmacists including a bibliography of their leading papers. He emphasized the fact that these achievements of the past indicated the research duty of pharmacy of today. He submitted eight research topics of vital need to pharmacy and cited a list of 27 topics along botanical lines that had been suggested by Albert Schneider.—Proc. Pa. Pharm. Assoc., 43 (1920), 125.

Pharmacist.—*Professional Education of.*—Henry Kraemer describes in detail what he believes should be the requirements of colleges of pharmacy and asks whether drug store experience should be required before or after college education, and to what extent and of what character. He tells the advantages of systematic study before, during and after graduation and registration, of high school training for matriculation at the college, and a college diploma, as prerequisites to examination and registration by the board of pharmacy. He also tells what the druggist's professional library should consist of and how it is to be used; how the pharmacist can best use his professional education and equipment for the service of the medical profession and the public at large; and finally discusses the financial returns which may be expected therefrom.—Amer. Drug. (Jan., 1920), 9. (L. N. B.)

Pharmacy and the New Education.—Charles O. Lee believes that pharmacy must be a contributing factor in the readjustment of education to the demands of present day civilization. The two common theories of education, utilitarian and classical or philosophical, are directly opposed to each other, the utilitarian making education's first purpose that of teaching how to make a living, the classical putting first ideals, aspirations and correct habits of thinking. Neither theory in its extreme will solve the nation's problems. A rational compromise is better than either. Mr. Lee believes that our "highest type of pharmaceutical education comes pretty nearly doing this. It combines splendid technical skill with a vast amount of information, not all of which is technical but which requires and develops thinking." He shows the close association of business and education, emphasizing the need of teaching of ethics, economics,

politics. A man is not educated unless he is concerned with the responsibilities as well as the privileges of citizenship. Pharmaceutical educators must assume their share in the development of moral intelligence, the creation of national character and the establishment of adequate standards for ethical ideals.—J. Am. Pharm. Assoc., 9 (1920), 1075. (Z. M. C.)

Pharmacy.—*The Professional Side of.*—Jacob Diner informs us that the most prominent part of the professional side of pharmacy is represented by the prescription department, and describes in detail how the prescription department of a modern pharmacy is managed, relating how the prescription is handled from the time it is received by the pharmacist until it is completed and delivered to the customer; discussing also the selection of the proper ingredients for its compounding.—Am. Drug. (Feb., 1920), 9. (L. N. B.)

Pharmacy Colleges.—*Bacteriology Courses in.*—E. N. Gathercoal makes a plea for more collegiate training in bacteriology. The author includes a tabulated form comprising a list of 46 schools with their respective requirements in bacteriological work—Drug. Circ., 64 (1920), 171. (F. H.)

Pharmacy Colleges.—*Courses in Pharmacodynamics in.*—A. R. Bliss, Jr., sent out a questionnaire to seventy-three schools and colleges asking for information as to the extent and manner of presenting materia medica, toxicology, pharmacodynamics and physiology. He gathers the reports into several tables and discusses the findings and the opinions expressed in a thorough way.—J. Am. Pharm. Assoc., 9 (1920), 378. (Z. M. C.)

In a second paper, Dr. Bliss discusses the time necessary for a general course in pharmacodynamics including both theoretical and practical work; outlines the scope of laboratory work for a course in experimental pharmacodynamics; and gives a list of materials required for such a laboratory course with the approximate cost of each item.—J. Am. Pharm. Assoc., 9 (1920), 1067. (Z. M. C.)

The Unstandardized Professor.—At the Washington meeting of the American Conference of Pharmaceutical Faculties, J. W.

Sturmer pointed out that while the conference had been busy standardizing college matters in general it has appeared to have overlooked the need of standardizing the professors. The paper gives some reasons why a standardization of professors might be desirable.—Am. J. Pharm., 92 (1920), 806.

Teaching Methods.—*Should Pharmacy Schools Modify.*—J. G. Beard thinks that too many schools are now teaching the pharmacy of the last century. He further thinks that scientific and commercial pharmacy cannot be divorced from one another for another generation. He further opines that more time should be spent on the laboratory plan of presenting pharmacy, together with a course on salesmanship, of buying and selling, not drugs alone, but every commodity forming a part of to-day's pharmaceutical commerce, based on the work of a registered pharmacist in an average store for an average day, this to be taught in a laboratory drug store maintained by the school.—Drug. Circ., 64 (1920), 441. (L. N. B.)

LEGISLATIVE PHARMACY

Alcohol.—*Its Relation to Science and Industry.*—In the discussion of this subject, Wm. L. Crounse gives some statistics showing the production of denatured alcohol for the period from 1907 to 1918 which should be convincing as to its necessity to industry. Much ignorance exists among prohibition zealots about its absolute necessity in the preparation of medicine. The retail drug trade has done a "splendid job of housecleaning" and wholesalers are co-operating. Mr. Crounse reviews the regulations of the Volstead act and suggests some of the changes that may be made to correct present incongruities. However much disgust retail druggists may feel toward the difficulties thrust upon them they should shoulder the burden and take out the necessary permits to use non-beverage alcohol unless they mean to become only purveyers of "toilet articles, tobacco, stationery, etc." and consequently "scrap a large part of their education."—J. Am. Pharm. Assoc., 9 (1920), 600. (Z. M. C.)

Cost Price Law.—*Fails of Enforcement.*—A law passed in Montana in 1919 required all dealers to mark the cost and sell-

ing prices on every article sold. Pharmacists were to be compelled to show in plain figures the cost and selling prices of such articles as a dozen compound cathartic pills or an ounce of Epsom salt. The Montana Pharmaceutical Association was instrumental in having the authorities restrained from putting the measures into effect. Since that time many former dissenters have swung enthusiastically into line for organization. — Bull. Pharm., 34 (1920), 135. (C. M. S).

Crude Drugs.—*Tariff on.* — Ernest E. Stanford traces the history of tariff legislation as it has effected drugs and medicines, considering separately the tariff history of narcotics and also the present status of the question of protection for our crude drug industry.—J. Am. Pharm. Assoc., 9 (1920), 966. (Z. M. C.)

Drug Store Experience.—*Relation to College and State Board.* —C. H. LaWall points out that there is need for reform in the experience requirements rather than their total abandonment and that this reform must be worked out jointly by educators and board officials. Dean LaWall has three requirements for a fully evolved plan.

First—A shortening of the total experience requirement for both graduation and registration from the antiquated four years to a period commensurate with the increase in preliminary requirements and length of college course.

Second—The development of a unit system of credits based upon actual professional or properly related duties and the abandonment of the present blanket certification based on time spent in a drug store.

Third—The certification to be invariably made by a competent person, preferably himself a registered pharmacist, who is thus made responsible for the accuracy of the statements. These requirements would automatically raise the morale of many drug stores, where the prevalent idea is that working in a drug store gives one the privilege to try State Board examination.

Dean LaWall suggests that the reform be worked out immediately in order to be ready for the new four year entrance requirement effective 1923 and the minimum three year college course starting 1925.—Am. Drug., 68 (Dec., 1920), 24. (M. O'C. D.)

Legislation.—*Rational and Irrational.*—J. H. Beal shows that wise laws and regulations are essential to order and progress but ill chosen and excessive regulation is as hurtful to the body politic as ill chosen and excessive medication is to the human body. He believes that the average citizen is too quick to take up the fanatic politician who promises everything rather than the conservative statesman who is not too sure of what he can do. He says that civil government in its foundation principles is eternal and that it is not a problem of mechanics but of human nature. No law can be 100 per cent efficient. We must accept laws with a relative restriction just as we accept everything else, relatively. Excessive and radical legislation is productive of lawlessness and the failure of emotional legislation are subjects which Dr. Beal deals with very conclusively. One fact which he brings clearly before us is that laws fail when they ignore human nature. A successful law is one that is successful because a liberal majority of people are thoroughly convinced of its necessity. In conclusion Dr. Beal gives some very sensible worthwhile remedies for vicious and meddlesome legislation which should be of material interest to all interested in the laws and law makers of our country.—Pract. Drug., 38 (Oct. 1920), 20. (J. M. W.)

Legislative Problems.—*Pharmaceutical.*—J. H. Beal states that the average pharmacist today studies more closely his legal obligations than he does his Pharmacopœia. He goes on to point out that in pharmacy legislation, the State and national associations which represent every branch of the drug trade liable to be affected by proposed legislation, should consider every detail possible before endorsing reform legislation. In a word avoid the appearance of secrecy when formulating any measure that will be for the common good; a house divided against itself can only meet defeat. Dr. Beal shows the necessity of care in the use of words or phrases of general import or those which may be interpreted several ways; such words as "derivative," "narcotic," "poison" should be limited or qualified in their use or they may be the source of interpretations very foreign to those intended by the framers of the measure. He urges that official boards should not be given unlimited discretionary pow-

ers, whereby they may enlarge the scope of the law under the disguise of rules and regulations.—Am. Drug., Nov. (1920), 17. (M. O'C. D.)

Metric System.—*Adopted by Latvia.*—The Latvian government has adopted the metric system of weights and measures but permits the use of the old Russian weights and measures where necessary until January 1, 1926.—Natl. Drug., 50 (1920), 167. (C. M. S.)

Metric System.—*Use in Jugoslavia.*—Consul K. S. Patton reports from Belgrade that the metric system is in general as well as official use throughout the Kingdom of the Serbs, Croats and Slovenes. With the exception of the oke (about 2¾ pounds which is used in Southern Serbia) no units other than the metric are used even locally.—Natl. Drug., 50 (1920), 378. (C. M. S.)

Mils vs. Cubic Centimeters.—*A Protest Against the Return to an Inaccurate Term.*—James F. Couch enters a vigorous protest against the proposal to eliminate the term mil in favor of the formerly used but inaccurate cubic centimeter. He proposes, in case millimeter is too cumbersome for common use, that the precedent of other scientific bodies be followed and the name of one of the eminent pharmacists Proctor, Squibb or Lloyd be given to the unit.—Bull. Pharm., 34 (1920), 412, 413. (C. M. S.)

Narcotic Drugs.—*Need for Regulation of the Exportation of.*—A. W. Linton gives accurate figures for narcotics shipped from Seattle during the five months ending December first, 1919. These narcotics were carried in Japanese vessels and were consigned to Japan where their sale is rigidly restricted and their illicit use very limited and where the number of physicians qualified to use narcotic drugs is small. That the bulk of narcotics purchased or manufactured by Japan goes to China, there is abundant evidence. In spite of legislation, large quantities are being shipped from Great Britain, some by parcels post, which is not forbidden, and by way of this country since "our laws allow foreign goods arriving at American ports to be placed in bond for trans-shipment without inquiry as to the nature of the

goods." Still more serious than being an intermediary for British narotics we are selling large amounts ourselves. We owe it to China to stop the sale of narcotics in the Orient, and our own interests demand a close guard on such exports, since some of it is brought back by smugglers. Remedies for this situation are suggested.—J. Am. Pharm. Assoc., 9 (1920), 801. (Z. M. C.)

Opium Law.—*Japanese.*—In giving a brief history of the control of opium in Japan, T. Kawamura states that the annual production is about 375,000 ounces while the consumption is about 500,000 ounces. The production, import and sale of opium is practically a government monopoly and the few sources of supply are subject to license and rigid control. That produced in the country, if of suitable quality, is purchased by the government and distributed from the official hygienic laboratories. If of low standard it is destroyed without compensation to the producer. Governmental supervision of opium dates from 1858 and the numerous amendments to the first law have practically abolished the illegitimate use of the drug. Japanese opium must contain 10 to 11 per cent of morphine and effective control is secured through the provisions of the present opium law and penal code.—Pharm. Era, 53 (1920), 37. (C. W. B.)

Paregoric.—*Abolition of.*—S. Kopald advocates the discouragement or discontinuance of the sale of paregoric. This he believes could be easily accomplished and would be of infinite benefit to children. They would be better off without it and as for adults, those having a hankering for the stuff should be given either the real article or nothing. He says that while tincture of opium has its legitimate use, paregoric has more abuse than use. The child who grows up without it is a brighter and healthier child and for the "good and welfare" of all concerned he asks for the voluntarily stopping of the sale of paregoric over the counter.—Pract. Drug., 38 (Sept. 1920), 32. (J. M. W.)

When is Poison Not a Poison?—John Uri Lloyd, in his usual clear manner discusses this question exhaustively. Biologists are aware, he says, that heroic poisons fail to act with some animals, while substances "not a poison" are destructive to others. The

answer to the question, he brings out, is more of a problem than a cursory glance would indicate.—Am. J. Pharm. 92 (1920), 323. (J. K. T.)

Virginia Board.—*Relation to the Retailer.*—A. L. I. Winne outlined the duties of the Virginia Board of Pharmacy and laws governing same. After comparing the board of which he is Secretary to the general run of boards, he turns to the pharmaceutical association. Describing how at the present time, these two organizations publish a pharmaceutical paper, bringing all the pharmacists of Virginia in close relationship not only to each other, but also to the board and the association, both of which are always at their service and ready to assist the pharmacist in any possible way.—Drug. Circ., 64 (1920), 7. (H. M.)

HISTORICAL PHARMACY

Alchemy.—*Notes on.*—When so eminent a scientist as Professor Frederick Soddy discusses in serious strain, as not being improbable, the transmutation of the baser metals into gold, one's mind turns back to those medieval gentlemen who tried so persistently and with such undimmed hope to accomplish this same achievement. Professor Soddy explains that it is all a matter of eliminating from atoms of the baser metal Alpha or Beta particles, as the case may be. Albertus Magnus and Raymond Lully, who searched so diligently for the Philosopher's Stone, by means of which their ingots of lusterless lead were to be turned into bars of ruddy gold, had little thought of atoms, molecules or ions, and yet the actual discoveries they and their fellow seekers obtained in the field of chemical science formed a not negligible groundwork on which latter day workers were able to build up the still incomplete structure of chemical knowledge. Of the numerous alchemists who flourished during, and in the centuries succeeding the middle ages, the Count de St. Germain was a notable figure. He was a distinguished and welcome habitué at the court of Louis XV. of France, where his claims to have discovered, among other things, the elixir of life were not entirely discredited. Of unknown origin and antecedents, his parentage was the subject of various speculations, one of them being that the mysterious count was the son

of an Arabian princess and a salamander! It seems to be an undisputed fact that he was in possession of a secret process for removing spots and flaws from diamonds, and that by utilizing this knowledge he made a considerable fortune. Mme. de Hausset relates that Louis XV had a stone containing a flaw and that the diamond in that state was valued at six thousand livres. The king entrusted it to St. Germain for treatment, and when it came back flawless had it offered for sale to a jeweler who knew nothing of its antecedents. The jeweler paid nine thousand six hundred livres for the stone—and Louis' respect for the Count increased in proportion.—Ind. and East. Drug., through Am. Drug., 68 (Aug., 1920), 22.

American Pharmacy.—*History of.*—E. Kremers discusses in Part I of this article the evolution of pharmacy in the American Colonies—The influence of Spain, France, Holland and England; work of the Jesuit Fathers; the surgeon apothecaries of New England; and Franklin's account of the Pennsylvania Hospital.

In Part II he treats of the War of Independence and period of reconstruction; the westward movement; the founding of Philadelphia College of Pharmacy and of other colleges, pharmaceutical associations and state laws.

In Part III, he describes changes in pharmaceutical economics; State control; State associations and their organization; State legislation and the passage of pharmacy laws; pharmaceutical education by the State and the nationalization and federation of pharmacy.—Am. Drug., Mch. 1920, 9; Apr. 1920, 9; and May 1920, 13. (L. N. B.)

Candy.—*The Oldest.*—Most of the black licorice comes from Spain, where it is made from the extract of the root and mixed with starch to prevent its melting in hot weather. The plant is about three feet high and grows wild where its roots can reach the water. It grows largely on the banks of the Tigris and Euphrates rivers. As the valley of the Euphrates contained one of the earliest civilizations in the world, it is probable that licorice is one of the oldest confections, and the taste which the boys and girls like so well today was enjoyed by the children

of Babylon and Nineveh three thousand years ago.—Sweets, through Drug. Circ., 64 (1920), 354.

Celestial Theriaca.—Dr. Wickersheimer has unearthed a curious document regarding the "celestial theriaca" prepared at Strasbourg in the seventeenth and eighteenth centuries. Three centuries ago the Alsatian capital had five pharmacies. One business which had existed in the Grande Rue since 1527 passed into the hands of Frederic Stroehlin in 1694, in whose family it remained until 1779. Frederic put "on the market" the theriaca in question, advertising it as superior to all others. It is interesting to note that in 1720, when mithridate or andromaque (current electuaries) could be bought at 16 sous an ounce, the "celestial" product fetched 2 sous a grain. The document discovered by Dr. Wickersheimer is evidently a form of advertisement. The MS. (preserved in the Strasbourg Library) dates from 1744, and pictorially represents the scores of drugs and substances that entered into the composition of this product of polypharmacy. Each is figured literally or allegorically in water-colors, and the arms of the city, the portrait of Æsculapius, Fame, and other embellishments complete the total.—Chem. & Drug, 93 (1920), 985.

Colonial Pharmacy.—An article on the drug business in colonial times shows that wherever civilized human society is found, there is also the physician and likewise the apothecary. The history of every old state contains references to druggists and the old newspapers contains their advertisements. Mention of one in particular is found in the year 1646 in Boston. Varied as the modern drug store is in its stocks the apothecaries of colonial times went much farther. Their lines ranged from medicines to carpets, from looking glasses to nails and brads. The article is very interesting, portraying as it does the vital need of the druggists in all times.—Pharm. Era., 53 (1920), 199. (J. M. W.)

Drug.—*Meaning of the Word.*—The article gives the definitions of nine German and one French authority. The word comes from the Anglo-Saxon "dryge," which means "dry," hence a dry herb.—Der Mörser through D. A. Apoth. Ztg., 41 (1920), 86.

Drug Myths and Legends.—F. B. Kilmer traces the derivation of the modern names for many drug plants to the mythical legends of ancient times. We find that many of our valuable medicines are colored with the glamour of legend and romance. —Pract. Drug., Jan. (1920), 20. (C. W. B.)

Fifty-Five Years in Drug Business.—It has been the privilege of John W. Ballard to conduct a retail drug business for nearly fifty-five years in one store. He gives a most interesting account of his experience. His early life and the difficulties attending the securing an education are described. He tells of starting his pharmaceutical career at Davenport, Iowa, at fifty dollars and board for the first year. His early days reminiscences are fascinating. His account of the two years spent in New York as a clerk and as a student at the New York College of Pharmacy are entertaining. Many facts are set forth that might be employed to advantage by druggists today. He commends organization to pharmacists, and believes that the pharmacist because of his education is better fitted for active work in civic affairs than the average citizen. Mr. Ballard comments on the vast progress made by pharmacy in fifty years. He believes in frequent and long vacations. The article is full of humor to which an abstract cannot do justice.—N. W. Drug., 28 (1920), 369. (C. M. S.)

Fifty-Two Years in Pharmacy.—Simon N. Jones, known to all pharmacists as the "grand old man from Kentucky," presents a very interesting paper as to impressions made upon him by the numerous changes which have taken place in the drug business during fifty-two years behind the counter. His summary is, "May a better day be dawning" for pharmacy.—Drug. Circ., 64 (1920), 403. (H. M.)

Forty Years in Pharmacy.—William Mittelbach describes his experiences from the time that he was graduated from the Philadelphia College of Pharmacy in 1879 until his recent retirement from business. After about a year and a half clerkship in St. Louis and Sante Fe he finally opened in 1880 a drug store in Boonville, Mo., his home town. Here for forty years he did business, seeing the many changes that have come about. In his

opinion these changes will result ultimately in two kinds of a drug store—one where all the sidelines may be found and one where the chemist and physician will hold forth. Mr. Mittelbach was always active in pharmaceutical circles, being twenty-four consecutive years treasurer of the Missouri Pharmaceutical Association. He was President of the Missouri association for one year, and has held various positions in the association, having always the best interests of pharmacy at heart.—Drug. Circ., 64 (1920), 285. (J. M. W.)

Galen.—Louis Gershenfeld gives a brief but interesting sketch of the life of this physician-pharmacist.—J. Am. Pharm. Assoc., 9 (1920), 520. (Z. M. C.)

Gun Powder.—*Discovery of.*—According to "X-rayser II", Roger Bacon almost certainly knew the explosive nature of gunpowder, and may have discovered it, but not so certainly its propulsive power, the discovery of which has been pretty generally attributed to Schwartz, the date assigned for it being 1320. But Hallam ("Europe during the Middle Ages") quotes an Arabic writer, whose works are preserved in the Escurial Collection, for the use of gunpowder in war as early as 1249, and he concludes that it was introduced into Europe by the Saracens. This does not positively rule out either Bacon or Schwartz, since the powder referred to (*pulvis nitratus* in the Latin translation quoted by Hallam) may have been merely a species of fireworks; and Bacon, then a student in France, was about twenty-six years of age at the time. Hallam, however, refers also to "another Arabic writer who seems to describe the use of *cannon* [my italics] in the years 1312 and 1325." He says, moreover, that the Chronicle of Alphonso XI. of Castile distinctly mentions the use of cannon at the siege of Algeciras in 1342, and adds that they were "sufficiently known" in France before that date. At any rate, Edward III. employed them at Crecy in 1346. Altogether Schwartz seems to be rather out of it.—Chem. & Drug., 93 (1920), 1565.

Hermes Trismegistus.—*The Patron Deity of Chemistry.*—One who is much concerned with the historical phase of pharmacy,

chemistry or medicine will be fascinated by the exhaustive review on this deity by Leo Suppan. Mr. Suppan arranges the review under the following headings: Thoth and Hermes; Hermes as alchemist; the Cambridge MS.; Hermes and Mephistophes. Each division is discussed in considerable detail.—Nat. Drug., 50 (1920), 240. (C. M. S.)

Hermes Trismegistis.—*His Books.*—Leo Suppan has compiled an interesting account of the writings of this ancient and rather mythical philosopher. The pharmacist is inclined to look upon this personage as a devotee of the healing art but this article shows him to have been deeply interested in a multitude of subjects. The compilation is divided into: a discussion of the Hermetic books by the ancient scholars Clement of Alexandria, Iamblichus, Seleukos and Manetho the Egyptian astrologer; extant Hermetic books: the "emerald tablet;" interpretation of the tablet; the controversy over Hermes, which includes the attack of Hermann Corning, a seventeenth century physician and historian, on the whole Hermitic fabric.—Nat. Drug., 50 (1920), 292. (C. M. S.)

Labelling.—*Ancient Symbolic.*—H. Schelenz discusses some of the curious inscriptions found on ancient drug jars; such as "Tr. ☉is Lips.", which he translates as Golden Tincture of the Leipzig formula, and "Mag. Oc. 69" which he thinks means magisterium oculorum cancrorum; the symbol of the crab (cancer) resembling strongly the figures 69.—Pharm. Zent., 61 (1920), 65.

Law of Constant Proportions.—*First Enunciator of.*—In a 10 page paper, C. Glücksmann presents testimony showing that the first presentation of the law of constant proportions was in a book "Lehre von den Verwandschaften der Körper," published in 1777 by C. F. Wenzel, a German apothecary and chemist. The article discusses the contributions of Wenzel, Richter, Lavoisier, Gergmann and Proust to the stoechiometric side of chemistry.—Pharm. Zent., 61 (1920), 463 and 493.

Linneus.—*His Relations with Pharmacy.*—Drake discusses Carl von Linné and his pharmaceutical relations. At the age of 28,

after eight years of study, he received, in Holland, the degree of M.D. Upon his return to Sweden (1738), he practiced medicine until 1741, when he became professor at the University of Upsala, where he did his remarkable botanical work. As professor of botany, he taught pharmacy students and among his duties was that of making visits of inspection at the various pharmacies of his neighborhood. One of his reports is still extant and is quoted in the article—Svensk farm. Tid., through Schweiz. Apoth. Ztg., 53 (1920), 533.

Magendie's Formulary.—*Comments on.*—The commentator, Prof. C. H. LaWall, writes in an interesting way of this Formulary which was issued in an English translation in 1824. A perusal of this book brings one to a realizing sense of how conditions have changed in pharmacy, chemistry, and the practice of medicine. While it no doubt reflects the spirit of the time in which it was written, the changes and advances made in our scientific knowledge in the last one hundred years have been so tremendous that it is more interesting as a curiosity than for any practical bearing it may have on the pharmacy and chemistry of today. However, as the author of the paper well puts it, "It is both pleasant and profitable sometimes to wander through 'quaint and curious volumes of forgotten lore.' "—Am. J. Pharm., 92 (1920), 216. (J. K. T.)

Medical Book.—*First American.*—Stan V. Henkels, collector of Philadelphia, is responsible for the statement that the first medical treatise in this country was printed in Philadelphia in 1723. The book is from the library of Dr. Jesse C. Green (dentist), who died a few months ago at his home in West Chester, Pa., aged 102 years. The book was first published in London and reprinted by Samuel Keimer, High Street, near the Market place, Philadelphia. Part of the title page reads: "Curiosities of Common Water Gather'd from the Writings of Several Eminent Physicians and also from more than Forty Years' Experience. By John Smith, C. M."

The extracts from the book should convince every one that the drinking of nothing stronger than water, recently made mandatory by constitutional amendment, is for the health of our citizens.—J. Am. Pharm. Assoc., 9 (1920), 1210.

Paris Hospital.—*Centenary of.*—F. Ashford White outlines the duties of the "internat" or apprentice pharmacist in the Parisian Hospital. The "internat" remains in the service of the Hospital for three years, during which time he studies under the guidance of a head-pharmacist. There is an "Association of Ex-Internes in Pharmacy" which is very active, and among its members may be mentioned some of the best pharmacists and surgeons of France. The present system was founded in November 1814, and the celebration of centenary was postponed because of the war.

The outlook for the "internat" is very bright, and in addition to dispensing, he carries out the pathological analysis and thus collaborates with the physician in his diagnosis.—Am. Drug., 68 (Sept., 1920), 28. (H. M.)

Pharmacist.—*A Huguenot.*—During the wars of religion (M. Guiraud tells us in his Memoirs of the Archæological Society of Montpellier) Jacques des Farges kept open shop in the centre of the town, Place des Cévenols. He had a prosperous business; his "fine new shop" had been honored by the visit of King Charles IX.; his theriaca, "eau d'ange," and "poudre de senteur" were highly reputed. But in February 1569 arms and gunpowder were found in his cellar, in consequence of which he, his wife, and family were arrested. The strife between Catholic and Protestant was bitter, and des Farges was a Huguenot. Soon after his arrest a furious mob battered in the doors of the pharmacy and sacked furniture and stock valued at over 10,000 livres, after which they set fire to the house. Not content with this, the rioters terrorised the magistrates and burgesses into delivering the unhappy prisoner into their hands, and he was hanged on the charred beams of his own house.—Chem. & Drug., 93 (1920), 985.

Parmentier.—*The King's Pharmacist.*—M. Leclair has recently published some details of Parmentier's career at the Hotel des Invalides. He was the first to obtain the post of Apothecary-Major by competitive examination, and Parmentier, who was then twenty-nine, held the post for six years. He received 600 livres, with lodging, light, and fuel (6 lots of wood, 100 faggots,

and 72 lb. of candles). In 1767 the "Medicinal Formulas of the Royal Hotel of the Invalides in Latin and in French" were for the first time published, but anonymously. In 1772 the Administrative Council, anxious to retain his services, gave him a formal "brevet" and decreed that he should have complete control of the stock and supervise the dispensing. The Sisters of Charity who served in the pharmacy protested through their Superior, and the matter was carried up to the Council of State, which upheld the Sisters of Charity, and Parmentier resigned his post. The King, however, presented him with a bonus of 1,500 fr. (instead of the usual 800 fr.) and doubled his year's salary. He was also authorized to retain his quarters at the Invalides during his lifetime; but evidently did not profit by this permission, for he was living in the Rue des Amandiers-Popincourt at the time of his death (1813).—Chem. & Drug., 93 (1920), 985.

Pharmacy.—*Ancient and Medieval.*—Zornig makes a valuable contribution to the history of pharmacy in a long article in which the progress of pharmacy is traced from its beginnings to the Fifteenth Century. Beginning in Egypt where the same individual was priest, physician and pharmacist, his presentation of the evolution of pharmacy may be summarized as follows:

B. C. 400-300. The time of Aristotle and Theophrastus. The first branching of pharmacy from medicine in the class of *rhizotomen,* the gatherers of medicinal roots and herbs.

B. C. 300-100. The migration of Greek medical thought to Rome. Creation of the pharmaceutical groups, *seplasiarii* and *pharmaceutæ.* Development of such words as *apothekæ, confectiones,* etc.

First Century B. C. The time of Dioscorides, Galen and Celsus, whose books describe such pharmaceuticals as plasters and pills.

Fourth Century A. D. Creation in Rome of officials to prepare medicaments.

A. D. 650. Pharmacy taught at the University of Salerno.

Eighth Century A. D. Arabian medicine, pharmacy and the foundation of chemistry by the Arabs.

A. D. 750. Opening of a public apothecary shop in Bagdad under the patronage of Caliph Almansur.

A. D. 829. The building of the St. Gall Monastery with its pharmacy and its garden of medicinal plants.

Ninth and Tenth Centuries A. D. Pharmacy in Central Europe in the hands of the monks.

Eleventh Century A. D. Avicenna and Abulcasis in their works lescribe many pharmaceutical operations, including distillation. First public apothecary shops opened in Italy.

Twelfth Century A. D. Drug shops (specionarri) opened in Cologne.

A. D. 1225. The first real apothecary shop opened in Cologne.

A. D. 1442. The first licensed pharmacists in Nuremberg.

Fifteenth Century. The first compulsory drug inventories such as Dijon (1439) and Frankfort (1450). The first official lists of drug prices, such as Stuttgart (1486) and Regensburg (1490).

Sixteenth Century. Paracelsus and the introduction of mineral substances into medicine. The first pharmacopœias beginning with that of Valerius Cordus.—Pharm. Zent., through D.-A. Apoth. Ztg., 41 (1920), 1, 15, 29, 43, 57, 71, 85, 99 and 113.

Pharmacy in 1820.—J. W. Sturmer presents a contribution to the history of pharmacy for the last hundred years which is interesting because of its philosophical discussion of the sequences of the Napoleonic wars on the world in general. In spite of the deplorable conditions, that period was followed by a glorious renaissance in science and art. And pharmacy was by no means unaffected by the developments that science brought about by the research work and discoveries of Berzelius, Humphrey Davy, Faraday, Cuvier, Dalton, Drummond, Gay Lussac, and Proust. Because of the work of these giants in the acquisition of knowledge, modern science had its beginning, making the last one hundred years the most prolific in useful discoveries in the history of the human race. This article should be read in its entirety to be fully appreciated.—Am. J. Pharm., 92 (1920), 210. (J. K. T.)

Pharmacy in 1870.—At the 1920 meeting of the New Jersey Pharmaceutical Association, Otto Raubenheimer recited the

events of interest to pharmacy that transpired in 1870. No less than 63 items are recorded.—Proc. N. J. Pharm. Assoc., 50 (1920), 101; Am. J. Pharm., 92 (1920), 562.

Pharmacy in 1870.—H. V. Arny reviews the pharmaceutical journals of 1870 and presents the record of that year which saw the birth of the New Jersey Pharmaceutical Association.—Proc. N. J. Phar. Assoc., 50 (1920), 50. (J. H.)

Pharmacy.—*Patron Saints of.*—"X-rayser II" presents the claims of St. Winifred, as recorded in the little tract of Father Alford (1712), now procurable in her neighborhood in a cheap modern edition, in which the miracles wrought by her from the time of her decapitation to that of Wenefride White of Wolverhampton (and later) are recounted. He adds: "I would rather, however, give my voice for St. Tecla, another Welsh saint, after whom the church and village of Llandegla, between Wrexham and Ruthin, are named. She too was a virgin martyr, and so numerous were the cures of epileptics wrought at her well that epilepsy was known as "St. Tecla's disease." Certain rites were necessary—the sacrifice of a cock or a hen (recalling Æsculapius), etc.—and there was a charge of fourpence, a small sum, as becomes a patron of pharmacy."—Chem. & Drug., 93 (1920), 1279.

Love Philtres.—*Ancient and Modern.*—E. J. Raynor states that a woman selling love philtres in London informed him that the dragons' blood just purchased by the customer would be put on the fire at midnight, and the following incantation would be recited:—

"It's not the stuff I wish to burn,
But for my lover to return;
May he not eat, nor drink, nor sleep
Until he returns to me to speak."

He then says: "The invocation of supernatural aid to awaken the passion of love in those who are the objects of desire, as in other forms of witchcraft, involves the idea of a diabolical pact, or at least an appeal to the intervention of the spirits of evil. Christian imagery of the devil as the dragon is derived from the

Bible, and whenever a 20 shilling Treasury note comes our way it may remind us of our patron Saint George, who overcame the spirit of evil, which is represented by a dragon. Curiously enough, the earliest Babylonian literature—circa 2000 B. C.—is a record of the combat between the god Marduk and the dragon of chaos. Mistaken etymology may explain why the blood-colored substance has been identified with the mythological dragon, and if the connection were established the superstitution would be nearer explanation. Probably there is an etymological connection between dragons' blood and mandragora, which is known among Orientals as the 'Love Plant,' and which they believe insures conception. Interpreters are agreed that *Mandragora officinarum* is the plant referred to in Genesis xxx. 14, and used in a metaphorical sense in Canticle vii. 13 by Solomon. Shakespeare's Juliet speaks of 'Shrieks like mandrakes torn out of the earth, that living mortals hearing them run mad.' Some years ago Messrs. Burroughs, Wellcome, and Co. published an interesting article on Mandragora, its history, and the superstitions connected with its use. Belief in forms of witchcraft appears to have existed in all periods of the world's history, and our age furnishes the same psychological problem."—Pharm. J., 104 (1920), 615.

Precious Stones.—*The Magic of.*—An article of interest says "none of the arts is more imbued with romance than that of gemology and probably no branch of the history of the art has been so surrounded by reverential superstition as that connected with precious stones." Then follows a dissertation containing many references not only to the stones themselves but to the virtue which attaches when they are engraved by a skillful person or under some particular influence.—Jewelers' Circular, through Nat. Drug., 50 (1920), 239. (C. M. S.)

Precious Stones.—*Use in Pharmacy.*—H. C. Demming presented a paper on the folk lore of precious stones with particular reference to the superstitious value attached to many of them as remedial agents.—Proc. Penna. Pharm. Assoc., 43 (1920), 172. (L. S.)

Prescription.—*A Biblical.*—R. W. Klein tells of having received one of this kind in the regular run of business. The customer gave the information that it had been copied from the Bible which led to the finding of the same in Exodus xxx, 22 to 25. It called for, pure myrrh five hundred shekels, sweet cinnamon two hundred fifty shekels, sweet calamus two hundred fifty shekels, cassia five hundred shekels, olive oil one hin. It was compounded to the evident satisfaction of the customer for it has been returned for refilling.—Bull. Pharm., 34 (1920), 463. (C. M. S.)

Price Fixing.—*An Ancient Experiment in.*—It is pointed out that Elbert Hubbard in 1914, discussing a book by F. F. Abbott, describes the efforts of the Emperor Diocletian in the Fourth Century to fix by decree the prices of commodities and records the failure of the experiment.—Am. J. Pharm., 92 (1920), 128.

Rochester Pharmacy.—*Centenary of.*—An anonymous writer gives the history of the Paine Drug Company from the time that it was founded in 1820, until the present time. It is still doing business on the same spot where it was first established. The business changed hands at different times and in 1873 the present building was erected by the Paine Brothers. From a small apothecary's shop it has grown to be one of the largest wholesale and retail drug business in New York State. The business boasts of having owned and operated one of the first soda water fountains in Rochester, but in 1885 when people began demanding elaborate drinks, it was given up and never since operated.—Pharm. Era, 53 (1920), 159. (J. M. W.)

A Roman Patent Medicine.—J. Hill Burton describes among other Roman relics found near Edinburgh the following: "One of these stamps is significant as telling us how a practice of the Roman medical school had extended along with other elements of civilization to the Lothians. It is a small bar of trapstone, with a raised inscription on each of the two sides. One of them relates to certain 'enodes,' a term known in ancient pharmacy for the cure of 'cicatrices' and 'aspritudines,' whatever these words may have meant. The other relates to a preparation of

saffron for disease of the eyes. Both these patent medicines, as we may call them, were the property of a certain Lucius Vallatinus, and as he prepared each he would stamp the case containing it with his name.....Had the cases of medicine with the stamps of medicine alone been found they might have left a doubt whether the medicaments were made on the spot or brought from some place nearer the centre of the Empire. But the finding of the original stamps shows us that Lucius Vallatinus prepared his medicines in Scotland, and probably practised as a medical man in the neighborhood of Tranent."—Nat. Drug., 50 (1920), 590. (C. W. S.)

The Saltpetre Man.—Frank Burrows points out the former importance of "the saltpetre man" in England and France. The saltpetre man was a commissioned official in France as early as 1540. During the French Revolution as much as 16,000,000 lbs. of saltpetre was obtained in one year. It was during the latter part of the 16th century that the saltpetre men become prominent in England.

According to figures given; during 1913, 1,081,744 tons of sodium nitrate was wasted in England; imported during the same year; 1,490,699 tons.—Pharm. J., 104 (1920), 543. (H. M.)

Synonyms.—*Origin of Pharmaceutical.*—Zada M. Cooper discusses the origin of the common names which attach to so many preparations now official or in common use. Both ancient and modern synonyms are discussed and many bits of fascinating history are reviewed. Fowler's solution, Basham's mixture, Goulard's extract, Dakin's solution and Listerine are among those commented on.—Spatula, 27 (1920), 7. (C. M. S.)

John Ward.—*Parson and Physician.*—D'Arcy Powell gave an address on this vicar, who practiced medicine as an avocation in the Seventeenth Century. In his note books, Ward describes many pharmaceuticals including opium, laudanum (then a solid extract) and antimony preparations.—Pharm. J., 105 (1920), 7.

John Wesley.—*The Pharmaceutical Side of.*—Chas. E. Dodsley pictures to us a few of John Wesley's recipes, which number

nearly 1,000 and which are compiled in the form of a medical treatise entitled, "Primitive Physic, or an Easy and Natural Method of Curing Most Diseases." The first edition of his work was issued in 1747 and several editions were published. Wesley considered "quicksilver in its native form is innocent as bread and water." But, bark, steel, and preparations of quicksilver are "far too strong for common man to grabble with." Dodsley questions whether or not, "homeopathy may have had its germ in this book," since it was published on the continent and in turn caused C. F. S. Hahneman to make his researches into the effect of small doses of simple remedial agents.—Pharm. J., 104 (1920), 26. (H. M.)

WOMEN IN PHARMACY

Women in the Drug Store.—A commentary on women pharmacists, embracing some of Mrs. Emily C. McRae's personal experiences and her ideas as to the advantages that pharmacy affords the woman druggist are of particular interest.—Am. Drug., (Sept., 1920) 33. (F. H.)

GEOGRAPHIC PHARMACY

France.—*Pharmacy in.*—Leland N. Brown, a member of the American Expeditionary Forces during the World War, relates his impressions of French Pharmacy as received while putting in some of his spare time after becoming acquainted with a fellow student at the Universite de Poitiers who happened to be a clerk in a French Pharmacy.—Proc. Penna. Phar. Assoc., 43 (1920), 170. (L. S.)

West China.—*Pharmacy in.*—E. N. Meuser, a resident of West China since 1909, gives an interesting account of the practice of pharmacy in that country. He urges the establishment of a department of pharmacy in the West China Union University at Chengfu.—Bull. Pharm., 34 (1920) 284, 285. (S. M. S.)

COMMERCIAL PHARMACY

Accountancy for Pharmacists.—*Essentials of.*—Charles B. Couchman directs attention to the fact that accountancy is not

just bookkeeping and that bookkeeping is the recording of certain facts which make analysis of a business possible. "The most essential part of accountancy is the determining of the particular information to be obtained by these analyses and summaries and the proper utilizing of this information for the good of the business."—J. Am. Pharm. Assoc., 9 (1920), 270. (Z. M. C.)

Advertising.—*Honest.*—Lyman F. Kebler directs attention to the marked improvement in advertising matter during recent years though there are still periodicals that accept advertisements of remedies that are downright fraud. He relates the circumstance that led an advertising agent to say to him that "Honest advertising won't sell goods" and that he asked the Secretary of the Assocated Advertising Clubs of the World to obtain for him an expression of opinion from men qualified to speak. He quotes from these replies some statements in very emphatic language that leaves no doubt about their belief in honest advertising. Dr. Kebler adds in conclusion that though some apparently high-class newspapers are still carrying the untruthful advertising that provoked the title of this article he believes that truth in advertising will eventually win.—J. Am. Pharm. Assoc., 9 (1920), 1098. (Z. M. C.)

Chain Drug Stores.—*Competing With.*—Clyde L. Eddy furnishes some very interesting statistics about chain stores, showing ownership and location of home offices. Their growth has been phenomenal; they now constitute 3 per cent of all the drug stores in the country and they do 6 per cent of all the business. He discusses the origin of the chain movement and why chain stores came into existence. He shows that honesty is a necessity in getting the confidence of the buying public; the value of the policy, "the customer is always right;" the importance of furnishing what is asked for instead of the "just as good" article; and that "misrepresentation is suicidal." There must be honesty in merchandise, honesty in advertising, honesty in the prescription department, ethical honesty. Chain stores fill many prescriptions in spite of the fact that lack of personality is a tremendous handicap; they preserve their identity as drug stores. Merchandising ability is perhaps the chief element in their

success. Pharmacists must face the facts. We must give service, we must win public confidence, we must advertise the prescription department, we must preserve our identity as drug stores. Above all we must inject our personality into the business.—J. Am. Pharm. Assoc., 9 (1920), 995. (Z. M. C.)

Chain Drug Stores.—*Curbing.*—Frank H. Freericks believes the chain store is an evil institution and enumerates the following influences as derogatory: professional training is entirely submerged by pursuit of commercial success; efforts to place pharmacy on a higher professional basis are retarded by the advertising of chain stores which educates the public to look for drugs and dolls in the same store; each chain store takes the place of several pharmacies because of their custom of using unregistered floor help. Most of the advantages claimed for the chain store are superficial except perhaps lower prices. The chain store is "most concerned with the question of how high the price can be put on advertised leaders to still serve as a drawing card." Everything considered the buying advantage for the public is imaginary and the direct disadvantages are enormous. Any analysis of the problem must consider the socialistic tendency involved. "The main bulwark against socialism today are the farmer, the retail merchant and the professional man." Thought must be given, too, to the unlimited power which capital may acquire when it is unrestrained. The use of capital to secure control of any particular line of endeavor constitutes "an intent to monopolize." It takes a comparatively small amount of capital to monopolize a retail business and the danger may not be recognized. Mr. Freericks believes that the chain store system can be checked by defining "an intent to monopolize" as "the ownership and control of more than a certain number of business places by the same person, firm or corporation when engaged in the distribution and sale of goods and merchandise other than of their own manufacture and production."—J. Am. Pharm. Assoc., 9 (1920), 1005. (Z. M. C.)

Chain Drug Stores.—*Number in the United States.*—In 1900 there were less than 50 chain stores, today there are more than 1500. Today there are 315 individuals or corporations, each

operating 3 or more retail stores, which total number is approximately 1563.

There are approximately 50,000 retail druggists in the country, and according to figures obtained from various sources, each retailer sells about $25,000 worth of merchandise annually, making a total of $1,250,000,000 annually for the group. Each year 21 corporations sell $76,000,000 worth of merchandise or 6 per cent of the total amount sold by retailers in the country. Twenty-one owners or four-ten thousandths of 1.0 per cent of the 50,000 drug store owners are doing 6 per cent of the business.

According to the facts presented, the chain store movement is still in its infancy and the next decade will see a greater growth than in the decade just passed.—Drug. Circ., 64 (1920), 161. (H. M.)

Chain Drug Stores.—*System in.*—B. E. Pritchard analyses the statement made in a drug journal regarding the supposed menace of chain stores to the average neighborhood drug store. Figures seem to indicate that the chain stores operating ten stores or more, do only about six percent of the total drug business of the country. Their overhead expense is usually greater than that of the average drug store and their success depends chiefly upon their ability to make turnovers and avoidance of overbuying and consequent accumulation of dead stock. The article is replete with personally gleaned information and is well worth the time it takes to read it.—Proc. Penna. Phar. Assoc., 43 (1920), 175. (L. S.)

Commercial Pharmacy Courses.—*Reconstruction Applied to.*—Charles O. Lee directs attention to the fact that many courses in commercial pharmacy use too much time on non-essentials. Courses should be formulated to teach business principles. By developing social consciousness instruction can inculcate breadth of vision and a desire to render service. Individual interests must cease to be paramount. We must recognize our mutual interdependence. "Every important business and industry concerns not only the men who are in it but the whole community." It is the business of teachers to "promote intellectual leadership in community affairs." College training should enable men

to "think straight" and they should take their part in assisting their students to become makers of society not simply members of it.—J. Am. Pharm. Assoc., 9 (1920), 162. (Z. M. C.)

The Druggist.—*His Relation to the Community.*—Lionel Meredith points out how the druggist, as chemist to the common people, can best discharge his duties and responsibilities while maintaining his professional dignity, social standing and commercial recognition. He also emphasizes the value of the good will of the community, the avoidance of all illegitimate, illegal and shady practices, and the inadvisability and danger of counter-prescribing.—Amer. Drug., (Feb., 1920), 12. (L. N. B.)

The Drug Store.—*The Business End of.*—At the meeting of the North Carolina Pharmaceutical Association, C. B. Miller presented an interesting paper, discussing the handling of customers, the prescription department, calculating cost of goods, proper buying and problems of prices.—Am. Drug. (Oct., 1920), 25.

The Drug Store.—*Manufacturing in.*—Mr. Geo. M. Beringer, Jr., sets forth manufacturing possibilities in a retail store. He shows quite conclusively that many of the pharmaceuticals which the retailer is in the habit of buying can be made to advantage in the store.—Nat. Drug., 50 (1920), 199. (C. M. S.)

Drug Store.—*A Workable.*—H. P. Hynson summarizes his excellent paper in this way: the proper policy is "to do chiefly, a prescription and drug business, to supply everything peculiar to the sick room; to furnish all kinds of surgical dressings, antiseptics, medical appliances, etc., to carry the most comprehensive prescription stock possible; to dispense only the very best products obtainable; to maintain an orderly and perfectly equipped prescription department; to employ only competent, courteous and experienced assistants; to abstain strictly from giving medical advice; to exclude all 'quack' medicines, nostrums, etc., to charge reasonable prices." Mr. Hynson gives also a code of ethics which he drafted and which was adopted by the Maryland Pharmaceutical Association. Any druggist would do well to adopt it as his own and it must be read in its entirety to be appreciated.—J. Am. Pharm. Assoc., 9 (1920), 387. (Z. M. C.)

Employe.—*How to Select the New.*—E. H. Cone present an information blank which he requires applicants to fill out. There is a reason back of each question and a study of the replies as well as the manner of going about it may be illuminating and most helpful.—J. Am. Pharm. Assoc., 9 (1920), 522. (Z. M. C.)

Investments.—*The Pharmacist's.*—Homer St. Clair Pace summaries his excellent paper in the following words: "Investments from the viewpoint of the pharmacist—opportunities classified between (1) investments of a speculative nature in which return is a profit and in which there is a business risk, with little or no opportunity to exercise effective control of the capital; and (2) investments by reason of loaning money for a definite time in consideration of a definite interest return, in which risk is minimized and no ownership responsibility or risks are assumed. The latter includes Government bonds, individual loans, real estate loans, etc. General suggestions as to choice of securities for various purposes."—J. Am. Pharm. Assoc., 9 (1920), 166. (Z. M. C.)

Medicinal Preparations.—*United States Exports of.*—The United States exports of medicinal and pharmaceutical preparations during 1919 amounted to $18,986,000 compared to $10,824,000 in 1918 and $9,740,000 in 1917.—Chem. & Drug., 92 (1920), 728. (K. S. B.)

Prescription Products Companies.—*Physicians Holding Stock in.*—Is the public getting a square deal when physicians are financially interested in the products that they may be called on to prescribe? Is the average layman's confidence in the medical profession likely to be enhanced when he learns that the physician to whom he went for treatment has a financial interest in the therapeutic agent which was prescribed? It cannot be too often emphasized that it is against public interest and scientific medicine for physicians to be financially interested in the sale of products which they may be called on to prescribe for the sick. It is perfectly true that there are many physicians who would not consciously permit financial considerations to warp their judgment, but it is not humanly possible to remain

unbiased in cases of this sort.—J. Am. Med. Assoc., 75 (1920), 1662. (W. A. P.)

Pharmaceuticals.—*Foreign Trade In.*—L. F. Schmeckebier directs attention to some statistics about our export trade. We have three great competitors, France, Great Britain, and Germany. The Bureau of Foreign and Domestic Commerce is ready to help American manufacturers sell their goods in foreign countries. The Bureau has issued several bulletins that furnish information to anyone who wishes to enter foreign markets and has also published articles in Commerce Reports and has in its files lists of importers and druggists. The Bureau can also furnish information on custom duties levied by foreign countries. This information is very necessary in order to determine actual costs and to know whether goods from all countries are admitted on equal terms.

It is important also to understand "Pure food and drug laws" of foreign countries. If an effort is to be made to increase exports in pharmaceuticals, the drug regulations of important countries should be made available. The Bureau of Foreign and Domestic Commerce and the Bureau of Chemistry have many of these on file in the original language, and they should be translated and published.

The author believes it advisable for exporting manufacturers to consider the possibilities of an export combination in accordance with the Webb Act, the administration of which is vested in the Federal Trade Commission. The Bureau of Foreign and Domestic Commerce can assist manufacturers also by indicating sources of raw materials and also where to obtain chemicals.—J. Am. Pharm. Assoc., 9 (1920), 892. (Z. M. C.)

Records.—*A Key to Business Success.*—E. Fullerton Cook directs attention to the need for druggists to recognize the importance of a proper accounting system. He shows how records influence credits, how they indicate status of business as to profits and losses, how they may be made the basis for fixing selling price through an analysis of sales, purchases, expenses, inventory and profits.—J. Am. Pharm. Assoc., 9 (1920), 175. (Z. M. C.)

The Sickroom Supply Department.—W. F. McGrath discusses the benefits of making sickroom supplies a separate and distinct department in every drug store. The proper methods of buying, storing, selling and advertising are also taken up.—Proc. N. J. Phar. Assoc., 50 (1920), 38. (J. H.)

DISPENSING PHARMACY

Medicines.—*Relative Cost of Proprietary and Nonproprietary.*—The exhibit of the A. M. A. Chemical Laboratory at the recent New Orleans session of the A. M. A. contained a card comparing the cost of drugs sold under proprietary and nonproprietary names. The following list compared the wholesale price per ounce of drugs sold under protected (proprietary) names with the same drug sold under a common (nonproprietary) name: Aspirin-Bayer, $0.85; acetylsalicylic acid, $0.16; Phenacetin, $0.65; acetphenetidin, $0.27; Atophan, $3.50; cinchophen, $2.00. Kelene (10 gm.), $0.56; ethyl chloride (10 gm.) $0.45; Duotal, $1.90; guaiacol carbonate, $0.80; Urotropin, $0.60; hexamethylenamine, $0.21. Sulphonal, $1.70; sulphonmethane, $0.80. Trional, $1.90; sulphon-ethyl-methane, $1.00. Diuretin, $1.75; theobromine-sodium salicylate, $0.70. Aristol, $1.80: thymol iodide, $1.00. Economy as well as scientific prescribing demands the use of nonproprietary names whenever possible.—J. Am. Med. Assoc., 74 (1920), 1473. (W. A. P.)

Chloral Mixture.—*Incompatible.*—Joseph Tait discusses the following prescription:

℞ Chloral Hydrat..... ℥ii.
Tinct. Nucis Vom..... ♏iii.
Tinct. Belladon..... ♏i.
Potass. Bromid..... ℥iv.
Liq. Opii Sed..... ♏iiss
Tinct. Hyoscyam..... ♏i.
Spirit Ammon. Aromat..... ♏ii.
Aq. Menth. Pip.....ad ℥vi.
Sig. ♏ii. every three hours.

The prescription, on the face of it, seems rather formidable, suggesting both chemical and therapeutical, or, rather, pharmacological incompatibilities. The most obvious chemical incompatibility is that of chloral hydrate and aromatic spirit of ammonia. As is well known, alkalies react with chloral hydrate to form chloroform and an alkaline formate. Alkali carbonates, as well as hydroxides, thus decompose chloral hydrate.

There is at the same time quite evident the evolution of CO_2, which on one occasion blew out the cork of the bottle. On mixing chloral hydrate and aromatic spirit of ammonia with water in the same proportion as the prescription but without the other ingredients the choloroform soon settles out in globules at the bottom, carrying with it the essential oils of the aromatic spirit of ammonia. On mixing the chloral hydrate with the spirit of ammonia (with aromatics excluded), and alcohol equal to that present in the other ingredients, the chloroform does not separate, but might readily do so on standing. It was found that by heating the solution to 65° C. the chloroform at once separated, and the same result would probably follow in time without heating. This suggests the risk of another dangerous incompatibility. The alkaline mixture contains the alkaloids of nux vomica, belladonna, hyoscyamus, and opium in the free state. These may not be precipitated, but if the chloroform separates out it will carry with it the strychnine, and atropine and hyoscyamine.—Chem. & Drug., 93 (1920), 1773.

Name.—*The Short and Catchy.*—A laborer went to a Brooklyn physician for treatment and was given three prescriptions. One of the prescriptions called for "Laxol," the word being written on a piece of blank paper without directions. The drug clerk misread the prescription and dispensed an "original" bottle of "Lysol," which bore the usual poison label. The man drank the entire three ounces of "Lysol" and died.—J. Am. Med. Assoc., 74 (1920), 1524. (W. A. P.)

Organic Drugs.—*Inorganic Incompatibilities of.*—Carl Brauback reports that an investigation of considerable breakage of

bottles of a certain proprietary had been traced to the presence of sodium bicarbonate. The explosions did not occur for some months and there was no gas in the fresh preparation. The crystalline deposit which had been suspected to be the cause showed 76 per cent ash, containing magnesium phosphate, calcium, sulphates and traces of iron. The magnesium evidently came from the yellow dock used and other drugs contained soluble phosphates. Sodium bicarbonate was the only soluble phosphates. Sodium bicarbonate was the only added chemical and the menstruum had been 20 per cent alcohol. In the alkaline mixture, the magnesium oxalate and soluble phosphates reacted to give the dense precipitate which was mainly magnesium phosphate.—J. Am. Pharm. Assoc., 9 (1920), 512. (Z. M. C.)

Prescribing.—*The Ethics of.*—Dr. James Burnet, after discussing the inadvisability of prescribing proprietaries and of giving verbal orders to the patient, such as "Take a pinch of chlorate of potash and dissolve it in a teacupful of water," gives the following essentials for an ethical prescription:

1. It should be carefully written on a sheet of note paper and not on a scrap of anything that comes handy.
2. It should preferably be written in ink.
3. It should contain the name (and probably also the address) of the patient for whom it is intended.
4. It should contain carefully worded directions for its use.
5. It should be initialed (or preferably signed) by its author.
6. When it contains dangerous ingredients, the words "not to be repeated" ought to be incorporated.
7. It should contain no incompatibility or any proprietary remedy, whose action is unknown to the author.—The Prescriber, through Am. J. Pharm., 92 (1920), 666.

Prescription Clinic.—Ivor Griffith and Adley B. Nichols discuss a number of bona-fide prescriptions, emphasizing the fact that not all incompatible prescriptions are non-dispensable. The paper must be read in its entirety to understand the particular incompatibilities and how to overcome the difficulties.—J. Am. Pharm. Assoc., 9 (1920), 515 & 979. (Z. M. C.)

Prescription Compounding.—*Skill not to be Charged for.*—Boots, Limited, a company which operates something like 500 drug stores in England has been convicted of profiteering. Complaint was made because of the price demanded for dispensing a prescription. The court refused to uphold the contention of the defendant, that skill in compounding was of equal value with the drugs contained in a prescription.—Bull. Pharm., 34 (1920), 89. (C. M. S.)

Prescription Prices.—*Average.*—This article shows how prescription prices throughout the country compare with a schedule recently published by the California Pharmaceutical Association—prices being computed upon the basis of quantity and dosage.

It is interesting to note that higher prices prevail in the South and West than in the other sections of the country, and that pharmacists in the middle West and the East charge approximately 20 per cent less for their prescriptions.—Drug. Circ., 64 (1920), 51. (L. N. B.)

The "Shake-Well" Label.—*Abuse of.*—J. Leon Lascoff directs attention to the too frequent use of this label when the application of scientific knowledge would make it possible to dispense the combination so that such a label would be unnecessary. He gives a number of prescriptions with details of manipulation to overcome difficulties all of which well illustrate his point.—J. Am. Pharm. Assoc., 9 (1920), 153. (Z. M. C.)

THE PHARMACIST IN LITERATURE

Literary Pharmacist.—Georg Urdang, after pointing out that Sudermann was a pharmaceutical apprentice for only one month, that Ibsen and Herzog were druggists only in their early years and that Bechstein and Stinde left pharmacy soon after they had obtained literary reputations, discusses at considerable length the poetry of the pharmacists Heinrich Zeise, Julius Lohmeyer, Emil Jacobsen and Theodor Fontane and the novels of

Theodor Heinrich Mayer and of Kaspar Ludwig Merkl. The paper is entirely critical; no biographical data being given.—Pharm. Ztg., 65 (1920), 1014.

The Pharmacist.—*French View of.*—H. Schelenz reviews in a thorough manner a romance published by Loela, entitled "Mary Gill, L'officine. Moeurs Pharmaceutique." This work has been termed a terrible accusation against pharmacists and their alleged sordid practices. Schelenz finds it to be super-naturalistic and quite unenjoyable.—Pharm. Ztg., 65 (1920), 229. (C. P. W.)

The Pharmacist in Literature.—*Some German Examples.*—Georg Urdang has published a book "Der Apotheker in Spiegel der Literatur" and from it presents as a special article a chapter on the pharmacist as found in the writings of the romantic and baroque authors of Germany. Among those discussed are Pinkpank, the apothecary in Brentano's charming fable "Schulmeister Kloppstock"; the apothecary in Jean Paul Richter's "Dr. Katzenberger"; and the two apothecaries, Marggraf, in Richter's "Der Komet." While Brentano's apothecary is an attractive character, those of Richter are caricature.—Pharm. Ztg., 65 (1920), 681.

The Pharmacist in Literature.—*Two German Stories.*—E. E. Sonnenberg discusses two novels in which pharmacists take leading rôles. One, "Apotheker Heinrich" by H. Heiberg, presents an uncomplimentary view of the German pharmacist; while the other, "Allerhand Käuze," is delightfully sympathetic. —Pharm. Ztg., through Apoth. Ztg., 40 (1920), 156.

MISCELLANEOUS

Alchemistic Symbols.—*Use as Decorations.*—These symbols, representing the elements and substances known to the alchemists, are either astrological signs or combinations of various geometrical forms. Those of the latter type are well adapted to decorative purposes and may be used to ornament pharmaceutical and chemical laboratories.—Pharm. Era, 53 (1920), 39. (C. W. B.)

American Pharmaceutical Association.—*Reorganizing.*—F. E. Stewart says: "The reorganization of the A. Ph. A. as a delegate body, controlled by delegates from state pharmaceutical associations, all the affiliated bodies working together under a code of ethics containing rules for the guidance of the pharmacists in their relations to each other, to the medical profession, and to the public, might indeed accomplish great things for legitimate pharmacy. But a house of delegates, made up of delegates from druggists associations, representing the commercial drug business and the manufacturers of nostrums medicines, would degrade pharmaceutical practice still further." Dr. Stewart cites the history of the medical profession, the origin of true pharmacy, the pharmaceutical field in the United States, the United States Pharmacopœia and the influence of pharmaceutical legislation to point out that pharmacy is historically and inherently a branch of the medical science and practice, and that the only way for pharmay to ever become a profession is to separate itself from the nostrum business, and then become affiliated with the medical profession as a branch of medical science and practice, at which time it must adopt the altruistic ideal upon which the practice of medicine was originally based.—J. Am. Pharm. Assoc., 9 (1920), 263. (M. O'C. D.)

Associations.—*Value of.*—In an article headed "Why I am an Association Man" H. V. Arny gives reasons for his being a member of a number of pharmaceutical associations. There are two fundamental reasons, why he believes, everyone connected with Pharmacy should belong to these organizations. One is for the benefit derived by the member and the other is for the good that one may do by co-operating with these same societies. The benefit derived is mutual. But Dr. Arny states that the busiest men make it their business not only to belong to but to attend the various meetings. While one might not always be able to do this in the case of national or state meetings, the meetings of local branches should be within the reach of all. And one owes it to his craft and himself to get away from his business, once in a while at least; have a vacation; mix with his fellow members and help along the cause of pharmacy. He also mentions particularly the eight national asso-

ciations of pharmacy, each dealing with a different phase of the drug trade and each accomplishing a vast amount of good along its particular line. In closing Dr. Arny makes an earnest appeal for all pharmacists to become local, state and national members and for those who are members of each to bring into the fold new members.—Am. Drug., 68 (Oct., 1920), 21. (J. M. W.)

Bulletins.—*Valuable National and State.*—C. H. LaWall points out that much may be learned from the various State and National Bulletins which are issued free or at the most a very small fee. The paper deals directly the scientific knowledge with which the pharmacist can fortify himself so as to be able to lend assistance in a variety of instances which come up in the daily life of the average drug store proprietor. Quite a number of bulletins are mentioned specifically showing the nature of the information disseminated in this manner. The few titles mentioned below will service to show the diversity of the subjects which are discussed. Removal of stains from clothing; important insecticides; household measurements; methods of disinfection, etc.—Proc. Penna. Phar. Assoc., 43 (1920), 180. (L. S.)

Gas Warfare.—R. P. Fischelis discusses this subject in a thorough and able manner. The first use of gas was in 1915 when the Germans used it at Ypres. In preparing to use gas, the U. S. Government gave all problems pertaining to it to the Chemical Warfare Service. The gases developed are roughly divided into three classes—lethal gas, lachrymatory gases and nauseating gases. Each of these gases has different subdivisions and each is different in the result produced. Then Dr. Fischelis describes the different methods for protecting from gas. French fans were used to clear trenches of gas; suits and gas masks were provided for each man also. These are described in detail together with the number of these articles manufactured. Besides the manufacture, each was tested minutely and nothing but perfect material was sent overseas. In addition to gas masks for men, gas masks for horses were also made but these presented a simpler task. Dr. Fischelis gives a very good idea of the problems pertaining to gas warfare that were met and

solved in a minimum amount of time by the corps of the Chemical Warfare Service.—Drug. Circ., 64 (1920), 3. (J. M. W.)

The National Research Council.—C. E. McClung in an address at the Washington meeting of the American Pharmaceutical Association explained how the Council came into existence, the form of the original organization and its reorganization since the war. The seven divisions representing sciences and technical branches are division of chemistry and chemical technology; division of physics, astronomy, and mathematics; division of engineering; division of medicine; division of geology and geography; division of psychology and anthropology; division of biology and agriculture. Besides these there are six general divisions including a government division, a foreign relations division and a states relations division. Mr. McClung explained how these various divisions are made up and how they operate, how the Council has been financed so far and how it is hoped it may be supported in the future.—J. Am. Pharm. Assoc., 9 (1920), 690. (Z. M. C.)

Pharmaceutical Research.—J. O. Lloyd's response to Dr. C. E. McClung's address on the National Research Council was in his usual happy fashion: beautiful word pictures and quaint imagery delighted his listeners.—J. Am. Pharm. Assoc., 9 (1920), 696. (Z. M. C.)

"Non-Secret" Versus "Secret" Remedies.—George E. Ewe defines the terms "secret remedies" and "non-secret" or open-formula remedies, gives objections to secrecy in connection with the use of patent drugs and discusses the advantages in adhering to the policy of open formula preparations. He directs attention to the attitude of Boards of Pharmacy, Boards of Health and the American Medical Association toward these remedies, and to the fact that the law-making bodies of the States and territories are considering formula disclosure bills and that some have already become law. Mr. Ewe discusses at some length the phases of the question touching quantitative composition and reports upon the analysis of a number of "secret" remedies. These include a rheumatic remedy, a remedy for skin diseases,

dandruff remedies and hair tonics, dental powders and liquid applications recommended for treatment of pyorrhea, a foot treatment, an astringent mouth wash, a horse liniment, a wax for applying heat for the treatment of rheumatism, a treatment for earache, an application used in the local treatment of spavin in horses, an antiseptic shaving lotion and heart medication plasters. In conclusion he well says "the elimination of 'secret remedies' or their elevation into the 'non-secret' class is in process of evolution, is inevitable, and to the advantage of all concerned."—J. Am. Pharm. Assoc., 9 (1920), 983. (Z. M. C.)

Pharmacist in the World War.—*Experiences of a.*—L. A. Buehler describes in an interesting manner his experiences as a pharmacist in the Medical Corps, in France. He gives some details of the diagnostic tests, he was called upon to perform.—Am. J. Pharm., 92 (1920), 442.

Pharmacy.—*Ethical Problems in.*—J. P. Gilmour introduced his paper with a review of the history of the term "pharmaceutical ethics" which, he showed, was first used in 1853 by Jacob Bell, who suggested that a code of ethics for pharmacy might apply (1) to the mode of conducting business; (2) the relations between principals and assistants; (3) regulation of prices, and (4) nostrums. The code of the American Pharmaceutical Association (1852) was articulated. Article 2 deprecated the underselling of neighbors, later known as "scalping"; 3 imposed a high standard for purity of drugs; 4 was directed against counter-prescribing and payment of commission to medical men; 5 dealt with the duties of pharmacists towards medical men; and 6 prescribed the duty of the pharmacist to obey the precept "Freely ye have received, freely give" in respect to additions to pharmaceutical knowledge and art. Since 1852 many similar codes have been given to the pharmaceutical world. The Glasgow Chemists' Association was responsible for one which recommended disciplinary powers as a terror to evil-doers. There is no end to the making of codes of ethics, but their multiplication does not seem to have much, if any, influence on human conduct in general. The only progress is in the diffusion of them and the consequent higher general standard of action. His

conclusions are that the conscience is the ultimate guide in pharmacy as in all other experiences of life.—Chem. & Drug., 93 (1920), 1043.

Pharmacy.—*The Future of.*—H. M. Whelpley discusses the present day conditions resulting from the World War. He notes that the demand for luxuries and non-essentials has taxed the capacity for production; reducing the facilities and available labor for the production of essentials. The economic situation demands cool, deliberate judgment. Druggists, he believes, can be of great help, for by their education and training they are cool but alert in emergencies. One thing he advises the druggist is to take care to have on hand staple stocks, but fewer luxuries and discourage their sale. Collect all accounts. Refuse long credits and discourage short ones. If this is done with untiring effort, benefit will be derived, at least in the realm of drugdom.—Am. Drug., 68 (Aug., 1920), 34. (J. M. W.)

The Right to Rest.—"A change that simply IS has come unannounced," writes John Uri Lloyd in speaking of a man's desire to retire from activity in the Association. Not that the man has anything against the Association or any of its members, for he really wishes the Association to make progress, but he is tired of his responsibilities. In a word, the man's viewpoint has changed; the old is gone, a new has taken the place. He lacks enthusiasm and zeal, he becomes indifferent, then dissatisfied, finally a fault finder; to continue in his activities he wrongs himself and does an injustice to the Society. It is now the duty, and should be the pleasure, of the Association to allow this man to do his last best service to himself, that is to resign in order to enjoy the rest that comes with the change in his life.—J. Am. Pharm. Assoc., 9 (1920), 238. (M. O'C. D.)

The War Veterans Committee.—*The Future of.*—Clyde L. Eddy believes that this committee should constitute itself a "preparedness" section of American Pharmacy. The chairman should keep in touch with the Surgeon-General of the Army and Navy, he should be familiar with the work of Navy Hospital Corps and the Army Medical Administration Corps and make

an effort to bring about co-ordination between them and the colleges of pharmacy. He should know to which schools the War Department might turn at any time for men with specialized training. This information should be reported each year, thus showing the "status of pharmacy as a military resource." —J. Am. Pharm. Assoc., 9 (1920), 609. (Z. M. C.)

B—APPARATUS AND MANIPULATIONS

Aluminum Vessels.—*Removing Scale from.*—From aluminum vessels, such as kitchen utensils, scale can easily be removed by heating the vessel just below the melting point of the aluminum, then rinsing the vessel with hot water, by which the scale is softened and can easily be removed. Grossfeld believes that the decomposition of the chalky deposit below its decomposition temperature (885°) is probably effected by the presence of small amounts of organic matter and magnesium compounds in the scale. The metal is not affected by this treatment nor does it become brittle.—Chem. Ztg., through Drug. Circ., 64 (1920), 382.

Bunsen Burner.—*New Type.*—Arnheim describes a burner with an open base connected with the burner tube. (Fig. 1.) The nozzle of the gas pipe fits into the latter, opening upward. If the nozzle is shifted to one side with the aid of a lever (A) the gas suction is reduced considerably. This burner possesses all of the advantages of the old Marshall burner together with air conveyor regulations.—Pharm. Zent., 61 (1920), 316. (R. B. F.)

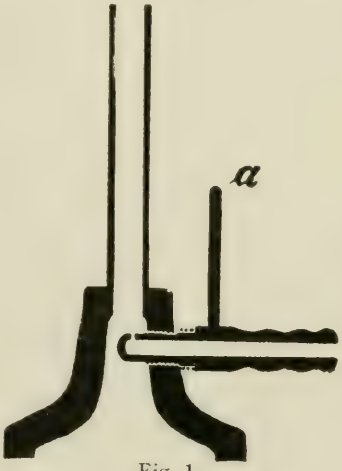


Fig. 1.

Distilling Apparatus.—*For Water Separations.*—G. W. Walker points out that in many laboratories where routine work is car-

ried on, it is necessary to re-distil certain solvents for further use. For this purpose a distillation flask and condenser are set aside.

The solvents in many cases contain water—for example, benzene and chloroform,—and on re-distillation this water necessitates the regular exchange of receivers, and, moreover, requires the constant attention of the operator, unless a revolving receiver be used.

The accompanying sketch (Fig. 2) illustrates a simple device for the distillation of such solvents as mentioned above, and involves no additional expense:—

The apparatus is the same as is used for an ordinary distillation, only the distillation flask has two leading tubes, both of which are connected by means of rubber tubing—one to the condenser B and the other to the flask D.

The liquid in the residue bottle F is blown into the funnel H, from whence it is allowed to flow into the distillation flask according to the rate of distillation. K is clipped and the distillation proceeded with. The water passes down the lower leading tube and is condensed in the flask D. When all the water has been driven off, the clip L is closed and the distillation proceeded with in the usual manner.—Chem. News, 120 (1920), 222.

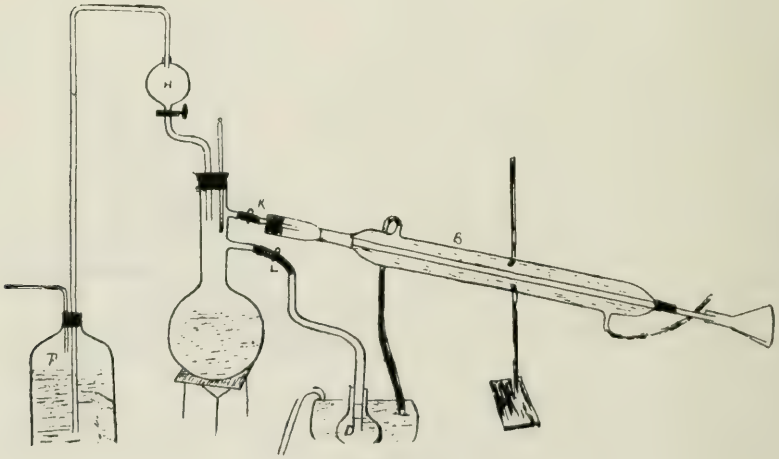


Fig. 2.

Distilling Apparatus.—*A Simple Form of.*—The apparatus shown in the accompanying illustration (Fig. 3) is recommended for the production of germ-free distilled water for use in intravenous injections. The distilling flask holds about 100 mils of fluid and will deliver 50 mils of distillate in 10 minutes by use of an ordinary Bunsen burner.—Pharm. Ztg., 65 (1920), 946.

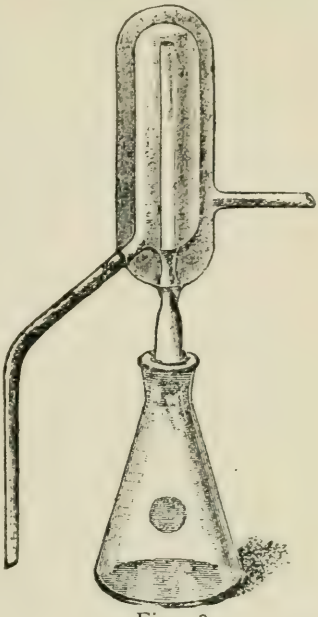


Fig. 3

Condensation Pump.—*The Langmuir.*—This is the most rapid of all vacuum pumps and also produces the greatest vacuum. According to L. A. Hawkins: "A stream of mercury vapor, produced by a small electric boiler, moving at a high velocity, entraps and sweeps along with it the air or gas molecules from the vessel undergoing exhaustion and delivers them into the air, while the mercury vapor itself is condensed and flows back into the little boiler." The Coolidge X-ray tubes are exhausted by use of this pump.—Merck's Rept., 29 (1920), 102. (H. M.)

Distillation Plant.—*A Practical.*—The object of distillation is the more or less complete separation of liquids possessing different rates of volatilization. When given a mixture containing the immiscible liquids of which the molecular weights are known, it is possible to determine by calculation: (1) The boiling point under a given pressure; (2) The composition of the evolved vapors; (3) The composition of the residue after partial distillation, and (4) The best method of separating the substances, either by raising or by lowering the boiling point by varying the pressure.

Masferrand reviews the work performed by Regnault, Duclaux, Sorel and Barbet verifying same with charts and tables.

Rectification may be continuous or discontinuous. The con-

tinuous distilling systems may be divided into four classes: 1. Systems with heating surfaces. 2. Contact systems, including (a) horizontal columns with mechanical movement; (b) percolating columns. 3. Full columns.

The discontinuous rectifier consists of only four essential parts: the boiler, the rectification column, the condenser and the tubular cooler. The continuous rectification has the advantage of constant and invariable working, thereby insuring regular production of uniform products with the minimum of fuels.—J. Soc. Chem. Ind., 39 (1920), 299T. (H. M.)

Evaporation.—*Spontaneous.*—Experiments were carried on by Weiser and Porter to test the accuracy of a statement made by Babington "that there are some salts which, being dissolved in water, do not retard evaporation, and some salts which, so far from retarding, actually accelerates evaporation." The experiments proved the statement to be erroneous. The chief source of error in Babington's work probably having been failure to maintain constant conditions of exposure. The factor which is most difficult to maintain constant is the extent of surface exposed, particularly if the containers are not uniformly clean. This source of error is magnified with saturated solutions which will creep badly if the sides of the container are not thoroughly clean. By carrying out the evaporations in clear glass containers on a rotating platform results can be duplicated consistently to within 1 per cent. All results obtained under these conditions are readily explained in terms of the modern theory of solutions.—J. Physiol. Chem., through Chem. News, 121 (1920), 80. (J. H.)

Extraction Apparatus.—*New Forms.*—E. Beccard has devised the apparatus shown in the accompanying illustrations. Fig. 4 is intended to extract an aqueous liquid held in A with ether or some other solvent that is lighter than water. Fig. 5 is for the extraction of an aqueous liquid with chloroform or some other solvent that is heavier than water. The advantages claimed

for the apparatus is that the solvent will pass through the aqueous liquids several times before it returns to the boiling flask.—Chem. Ztg., through Pharm.-Zent., 61 (1920), 107.

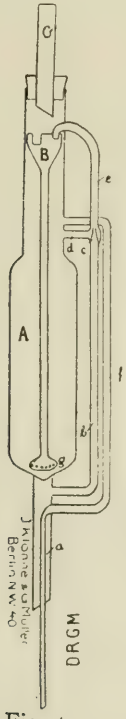


Fig. 4.

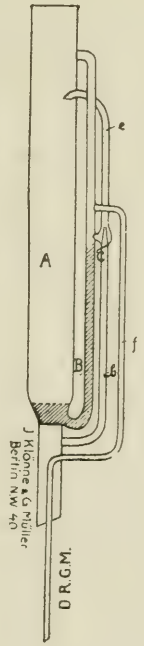
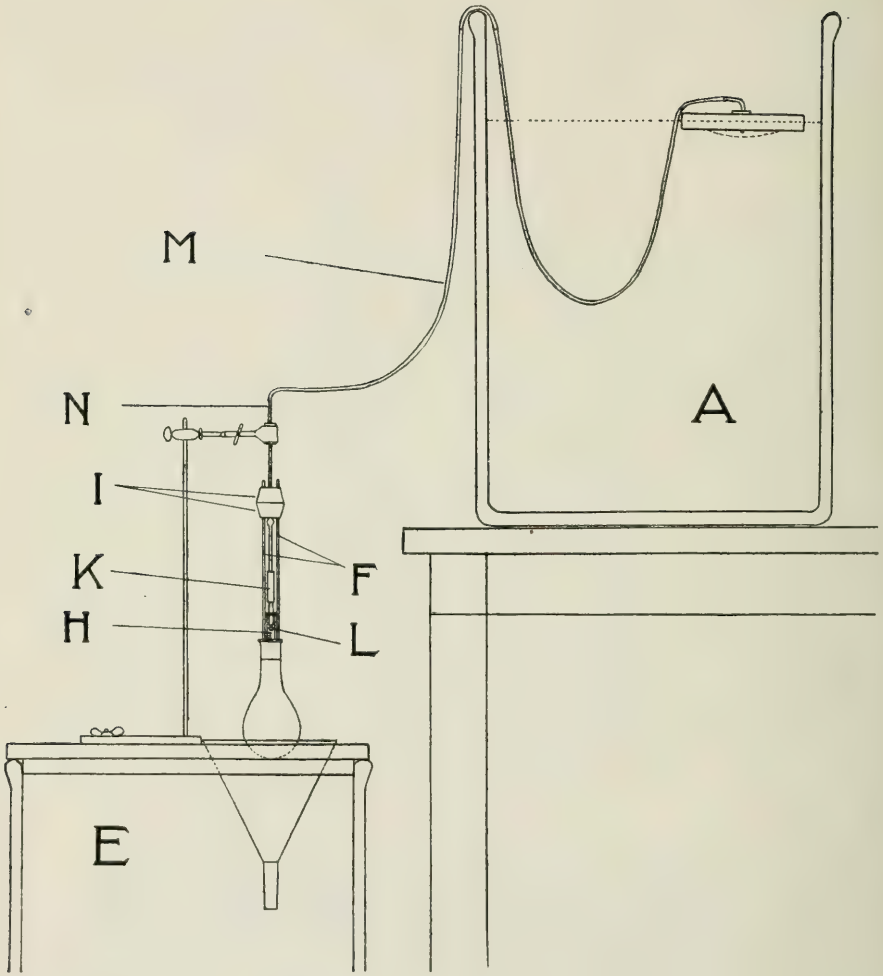


Fig. 5.

Filter.—*Inexpensive Control.*—E. C. Austin gives a descriptive account of the apparatus to be used, together with a detailed drawing of this new filter control. (Fig. 6). It depends upon the principle of the syphon, together with a Luer syringe, the plunger of which is attached to a float. This float rises and falls with the volume of liquid in the funnel, thus automatically operating the plunger which controls the syphoning over of the material to be filtered.—Drug. Circ., 64 (1920), 245. (L. N. B.)

Fig. 6.



Filter Paper.—*Detection of Iron in.*—A. Gawalowski discusses the well-known reaction of potassium thiocyanate on traces of iron in filter paper. He finds that when the acid used in the reaction is hydrochloric or sulphuric, several minutes sometimes elapse before the blood-red color appears. On the other hand, when diluted nitric acid is employed, the color change is almost instantaneous.—D-A. Apoth. Ztg., 40 (1920), 156.

Filter Presses.—*Various Forms of.*—E. A. Alliott presents an interesting and fully illustrated paper on filter-presses, dealing with this subject in the following order: (1) Construction of the simple or "non-washing" filter press; (2) choice and care of the filter cloth; (3) theoretical and practical considerations concerning pressure, viscosity, rate of flow, cake thickness, size and shape of suspended particles; (4) methods of feeding the press; (5) washing the filter press with details of construction; (6) air drying, steaming, hot and cold presses; and (7) labor in discharging.

Anyone interested in this subject and desiring full information would derive much knowledge by reading the original article.—J. Soc. Chem. Ind., 39 (1920), 261 T. (J. M. W.)

Filtration.—*Accelerated.*—G. Bruhns points out that the rate of flow through a simple folded filter-paper may be increased by turning back the loose end of the three-fold layer so that it projects into the funnel like a tongue.—Chem. Ztg., through J. Soc. Chem. Ind., 39 (1920), 315 A.

Filtration.—*Centrifugal.*—W. J. Gee recommends the centrifugal apparatus shown in the illustration (Fig. 7) especially for removing fine particles. In this apparatus, the drum (26) is secured to the base (1) by a bayonet-jointed locking-ring, the base being attached to a spindle (4) suspended from a patent ball-bearing. Rotation is imparted by the pulley (32). The bearing (34/41) is supported by a conical pedestal (67), to which is riveted a top casting of steel (66). The pulley (not shown) on the main driving shaft is fitted with a clutch of centrifugal friction type, which provides means for controlling the machine. The upper end of the drum (26) is closed by a top plate (20), which makes, during rotation, a watertight joint (31). This

plate is provided with a central opening through which the machine is charged; it is also held centrally on the spindle by a distributing plate (19). Depending from the top plate (20) is

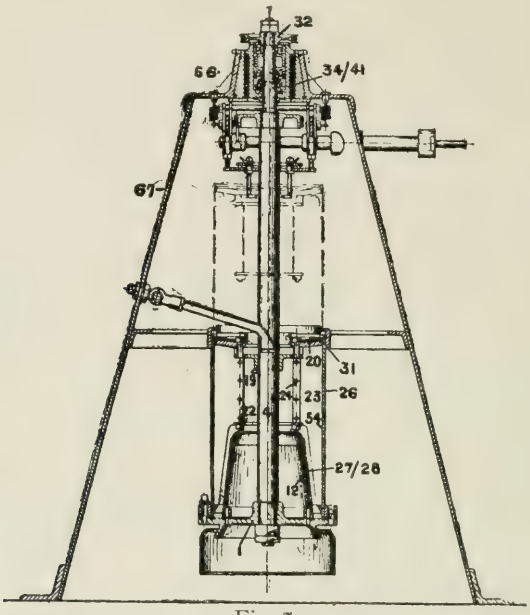


Fig. 7.

the container, consisting of six vertical rods (24), with attached vanes or blades (23). These extend the whole length of the drum, being connected to the top plate (20), middle plate (22), and bottom plate (25). They serve the double purpose of dividing the drum into six longitudinal compartments, and compelling the liquid under treatment to rotate with the drum, so avoiding slip.

Each compartment is provided with a thin residuum plate (54), forming a removable lining, curved to the radius of the drum. Upon these plates the recovered solids are deposited. When fully charged the container is lifted into the position shown in dotted lines. The recovered solids may then be removed without disturbance. A duplicate set of plates is supplied with each machine, and when the charged plates are removed the other set is inserted, and the machine put again into operation without delay. The charged plates are dealt with

whilst the new charge is accumulating. Fitted to the base (1) is a perforated filter cone (12), projecting into the separator drum (26). A filter medium, cloth, paper, or other suitable substance, is wound round and secured to the outside of the filter cone by screwed wire clamps (27/28). The lifting of the container in order to remove the recovered solids is effected by a screw and bevel gear operated by cone clutches, connected to a continuously running counter-shaft, belt driven from the main power shaft. A nut carrying levers is connected by wire ropes to a ball-bearing turn-table, provided with means of attachment to the top plate (20) of the container.—J. Soc. Chem. Ind., 39 (1920), 255 T.

Fractionating Flask.—*For Frothing Liquids.*—E. Lenk describes a new fractionating flask. The lower end of a reflux condenser, the inner tube of which is formed into a series of pear-shaped bulbs, is fused on to the neck of a distillation flask at a point opposite to but below the side tubulure of the flask. By means of a three-way cock the air may be exhausted from the condenser or from the receiver attached to the outlet tube of the flask. In the distillation of viscous liquids a vacuum is first created in the condenser, into which the froth rises and is broken against the walls of the bulbs, and when the liquid is boiling quietly the air is exhausted in the other direction and the distillation continued.—Chem. Ztg., through J. Soc. Chem. Ind., 39 (1920), 430. (A)

Frothing.—*Prevention of.*—Frothing of liquids containing albuminoids, soaps, etc., can be prevented according to Fiske by the addition of substances which have a high surface tension and high surface activity and which are only slightly soluble and slightly volatile. Substances with these properties are esters with high molecular weights, such as isoamylisovalerate, with which good results were obtained.—Chem. Cent. through Pharm. Weekbl., 57 (1920), 164. (H. E.)

Home-Made Apparatus.—J. Pike discusses "The Pharmacist as a Mechanic." Among various contrivances described by him (See Fig. 8) are (1) a cardboard or tin scoop; (2) a metal straining cloth frame; (3) a wire tripod to be used as a funnel holder;

(4) a home-made funnel; (5 and 6) photographic trays; (7) metallic hot water plate.—Pharm. J., 105 (1920), 27.

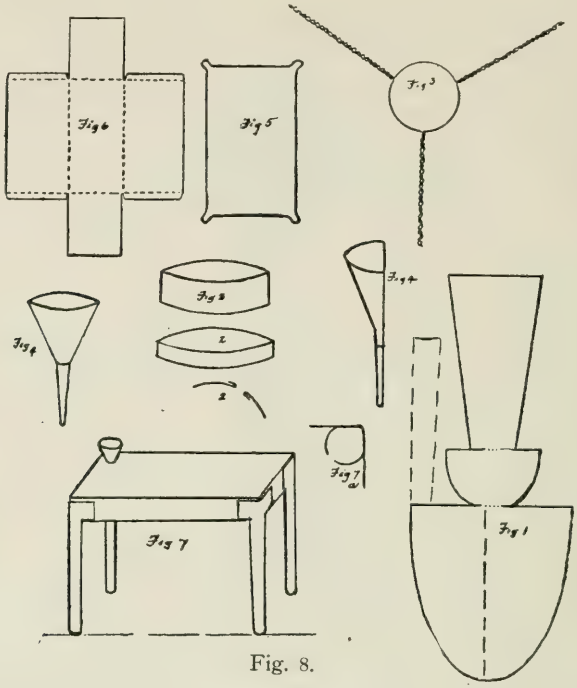


Fig. 8.

Melting Points.—*The B. P. Method of Determination.*—W. L. Thomson finds that if the directions of the British Pharmacopœia are followed in taking the melting point of diacetylmorphine hydrochloride, trouble is experienced. The melting point of the salt is 231-232°, and in accordance with the directions the liquid should be heated to 226°C., and the melting-point tube containing the diacetylmorphine hydrochloride inserted. If this is done, immediate melting takes place, while "visible change" takes place at a considerably lower temperature. As the British Pharmacopœia defines the melting point as that point at which "visible-change" first shows, a sample of diacetylmorphine hydrochloride would not give the correct melting-point if the melting-point is taken as directed. But if the melting point of diacetylmorphine hydrochloride is taken in the usual manner, the true reading is obtained without any difficulty. In the case of cocaine

whose melting point is 98°, the British Pharmacopœia directions again do not apply. In criticising Appendix VIII of the British Pharmacopœia, the author said it appears as though the compiler of the monographs had either tired of his monographs or come to the conclusion that their insertion was of dubious value. If the British Pharmacopœia is to have such an appendix, its treatment should be in the hands of a properly trained chemist.—Chem. & Drug., 92 (1920), 149. (J. M. W.)

Melting Points.—*Exact Reading of.*—M. François points out the inaccuracies in the ordinary methods of observing melting points and recommends the apparatus illustrated below. (Figs. 9 and 10).

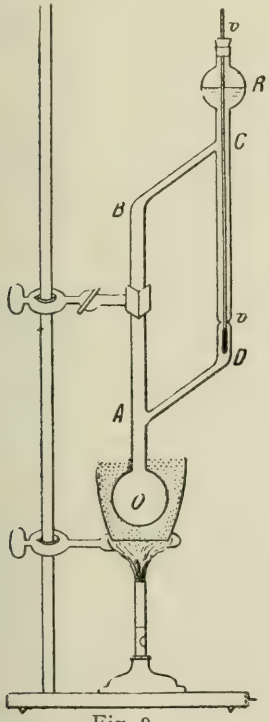


Fig. 9.

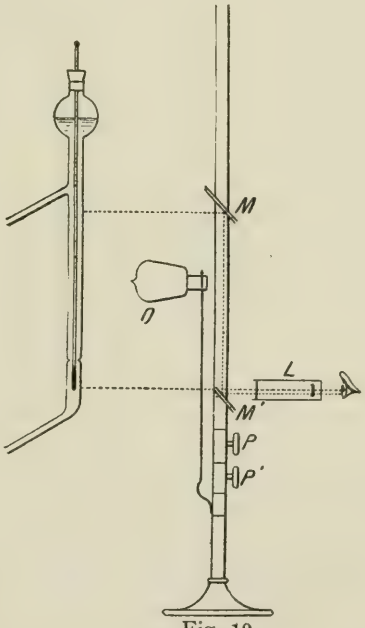


Fig. 10.

Fig. 9. A., B., C., D., circulatory melting point tube; O, bulb containing oil; R, highest level of oil in tube; V, thermometer with capillary tube attached.

Fig. 10. M. and M¹., mirrors; O, electric light; L, telescope; P. and P¹., adjusting screws.

The melting point flask is filled with oil and rests in an air bath. The thermometer is read by means of the helioscope arrangement shown in Fig. 10.—J. pharm. chim., 22 (1920), 215.

Mixing Apparatus.—*Automatic.*—P. Forman describes an apparatus devised and patented by him for the purposes mentioned in title. Illustrations are given.—Proc. N. J. Phar. Assoc., 50 (1920), 53. (J. H.)

Percolation.—A. Goris publishes a very interesting study of the theory and practice of percolation. After briefly reviewing the history of percolation, he proceeds to consider the forces at work during the first stages of percolation, viz., weight and density of the menstruum, capillarity, diffusion, osmosis, and viscosity, the conclusion arrived at being that there must exist an optimum rate of flow. The principal advantage of percolation is the increased yield of tincture or extract, but it must also be borne in mind that in percolation a liquid containing substances in solution may have, and often has, a solvent power with regard to other substances that the pure liquid does not possess; thus with rhubarb the presence in the menstruum of gallic acid, cinnamic acid, and gluco-gallin enables the menstruum to dissolve rheopurgarin; with bitter orange-peel the presence of aurantiamarin enables the menstruum to dissolve hesperidin and isohesperidin. A further advantage is that the active constituents are rapidly withdrawn from the action of enzymes. Bridel has shown that tincture of gentian (made from a root containing gentiopicrin) made by maceration is devoid of gentiopicrin, which is destroyed by the enzyme, whereas when made by percolation the gentiopicrin is retained. The state of subdivision of the drug is not without influence; it might appear that the finer the powder the better the exhaustion would be, but experiment has shown that with cinchona bark a coarse powder gives the best result, with ipecacuanha a medium, and with stramonium a fine. The powders should be dried, at least so far that the amount of moisture does not exceed 2 to 5 per cent. Moistening the drug, sifting, and preliminary maceration are

regarded as necessary. The form of percolator to be preferred is that recommended at the International Conference at Brussels, although according to the author, theoretically a special percolator should be used for each fineness of powder (but his reasoning is not easy to follow). Many experiments are required before any definite rate of flow can be fixed, and in such experiments regard should be had to the fineness of the powder, the nature of the drug and of the menstruum. Percolation in a percolator surrounded by a jacket in which water is maintained at 80° gives excellent results.—Bull. Sci. Pharm., through Pharm. J., 104 (1920), 225.

Percolation.—*Theory of.*—J. F. Couch presents a comprehensive history of the art of percolation. Its remarkable bibliographic value may be realized when it is stated that throughout the 54 pages of text are scattered 204 references; while at the end of the paper, there are 10 pages of chronological bibliography.—Am. J. Pharm., 92 (1920), 770 and 853.

Percolator.—*Who Invented the Narrow?*—G. M. Beringer discusses the early history of the narrow percolator and concludes it was C. Lewis Diehl, who described a narrow percolator in 1879, rather than Oscar Oldberg, who described it in 1884, to whom the credit of this form of percolator is due.—Am. J. Pharm., 92 (1920), 796.

Platinized Glass.—*Use as Electrodes.*—G. Meillère states that the high cost of platinum made it necessary for him to seek for a cheaper substitute and this he found well covered by platinized glass. This he prepares by taking a glass microscope slide, or a piece of a test tube, removing its smooth surface by dipping into hydrofluoric acid and then painting it with a paste made from dry platinic chloride and oil of chamomile or lavender, thinned with methyl alcohol. After this paste is applied smoothly and uniformly, the glass is heated until the oils burn off, leaving a layer of metallic platinum upon the glass. The painting and

burning are repeated until a sufficiently thick coat of platinum is found upon the glass.

Before coating, a piece of platinum wire should be fused into the glass and care should be taken to have the platinum coating in direct contact with the wire.—J. pharm. chim., 21 (1920), 311.

Poison Indicator.—Cut a piece of heavy, coarse sandpaper and glue it to the top of the stopper of the poison container. A person's hand coming in contact with the top of the stopper will be warned of the potent contents of the bottle.—Electric. Experimenter through Bull. Pharm., 34 (1920), 81. (C. M. S.)

Porcelain.—*A Workable.*—It is well known both to the physicist and to the manufacturer that glass and porcelain behave very differently upon heating. While vessels of porcelain easily crack and burst and in consequence of this are not capable of taking a secondary alteration of form, most varieties of glass can be softened by heat and then bent, extended, or blown into the form desired. It is this quality of glass which is so useful to chemists and physicists in the laboratory, and this is why glass is so greatly preferred to ordinary porcelain for the making of chemical and physical apparatus. It is now reported, however, that a foreign firm has lately succeeded in producing porcelain vessels which are highly resistant to changes of temperature. For the solution of this problem it was necessary to produce a glaze having exactly the same co-efficient of expansion as the mass of porcelain itself. In this way it was possible to obtain porcelain vessels highly resistant both to temperature and to fracture, since the cracking and bursting of porcelain apparatus at abrupt changes of temperature is usually due to the creation of strains between the glaze and the mass as a result of unequal co-efficients of expansion of the two materials. These new porcelain vessels, on the contrary, can even have holes fused in their walls by an oxyhydrogen blow-pipe without cracking. Moreover separate pieces of porcelain can be fused together exactly like glass, so that a porcelain tube, for example, can be fused into the wall of a dish. Finally this

new porcelain can be softened and blown like glass.—Sci. Am., through Merck's Rep., 29 (1920), 139.

Sterilization Tube.—F. Mezger has devised the container for sterile liquids shown in the accompanying illustration. (Fig. 11.) The container is the pipette (A) the neck (H) of which is bent, terminating with an inverted thistle funnel (B) filled with sterile cotton. Into the thistle funnel is fitted a rubber stopper through the orifice of which passes a tube closed with a rubber cap (J). The tip of the pipette is fitted with a rubber stopper (G) fitted to which is a glass test-tube (F). A rubber cap (J^1) is also provided for the pipette tip. Near the top of the pipette bulb is an opening provided with a rubber stopper (D). If desired the three rubber stoppers may be replaced by ground glass stoppers.

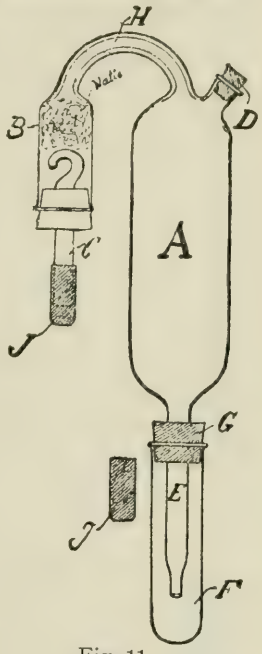


Fig. 11.

The pipette is filled with the fluid through the orifice (D), the two ends of the pipette being closed by the rubber caps (J and J^1). The pipette and its contents are then sterilized in steam or tyndallized as the case may be, after which the rubber cap (J^1) is replaced by the glass tube (F). When the fluid is to be used, the glass cap (F) is removed and by manipulating the rubber cap (J) as much or as little of the fluid can be removed as desired.—Münch Med. Wsch., through Pharm. Ztg., 65 (1920), 312.

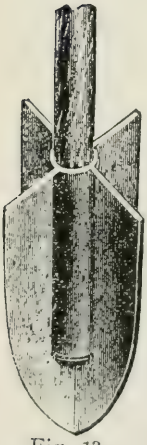
Suppository Mould.—*Simple.*—C. A. Mayo directs attention to this mould for a single 30 grain suppository and explains how to operate it. He gives also special directions for the preparation of different mixtures in order to handle them most easily.—J. Am. Pharm. Assoc., 9 (1920), 593. (Z. M. C.)

Syphon.—*Safety.*—The syphon shown in the accompanying illustration (Fig. 12) has been patented in Germany. When the short arm is plunged into the fluid to be syphoned, it will become partly filled with the fluid. Then the stop cock at the end of the long arm is closed, a portion of the liquid to be syphoned is poured into the thistle cup at the bend of the syphon, the stopper at the bottom of the cup is opened, when the fluid will run down both the long and the short arm filling the syphon. Then the stopper in the cup is closed tightly, the stop-cock in the long arm is opened; when the liquid will syphon over freely.—Pharm. Zent., 61 (1920), 622.



Fig. 12.

Test-Tube Cleaner.—The accompanying illustration (Fig. 13) shows a simple test-tube cleaner consisting of a wooden stick upon which is slipped a double-winged piece of rubber.—Chem. Ztg., through Pharm. Ztg., 65 (1920), 946.


Fig. 13.

Thermometer.—*Introduction of the Chemical.*—T. P. Teale states that in 1852, when he was a student at King's College, the only instrument of precision in use was the stethoscope. Later came the ophthalmoscope, which was introduced into England by Dr. Mader, a Polish refugee. Referring to this, Dr. Teale says:—"But the ophthalmoscope was destined to have a wider field. It occurred to a young physician of Leeds, Clifford Allbutt, that it must come into use by the physician. He took every opportunity of mastering its use, including the field offered by the West Riding Asylum, thanks to the collaboration of Crichton Browne. Allbutt finally brought the matter before the profession by publishing a work 'On the Ophthalmoscope in Medicine.' It is generally known that in the introduction of the clinical thermometer Mr. Reynolds, of Reynolds and Branson, Leeds (then Reynolds and Harvey)

played an important part. Originally, said Dr. Teale, the instrument comprised 'two long thermometers in a *"sesquipedolian"* box, about 12 inches long, which the poor doctor had to carry about under his arm. Clifford Allbutt again came to the rescue. Realizing the enormous possibilities of the instrument, and the necessity of easy portability, he devised, with the aid of Mr. Reynolds, of Harvey and Reynolds, of Leeds, the short thermometer that could be carried in the waistcoat pocket, and he got a scientific friend to invent an index that would register the temperature." Referring to the introduction of the hypodermic syringe, Dr. Teale quotes from an introductory address, delivered by himself in 1867, in which he said: "There has been granted to us one of those discoveries which, like chloroform, mark an era in our history—*hypodermic injection*. Valuable though this mode of treatment may be in its command over pain, it is still more important to the advance of science in the field of inquiry it has opened out, not only for testing the value of medicines, but also for searching into the nature of morbid processes themselves."—Lancet, through Pharm. J., 105 (1920), 222.

Vacuum Flask.—*New Type of.*—H. Goedecker has patented the vacuum flask showing in the accompanying illustration (Fig. 14). This it will be noticed is a flask provided with a perfect fitting ground glass cap provided with a side tube. In the neck of the flask is an orifice of same diameter as the side tube. The substance that is to be preserved in vacuo is placed in the flask, the cap is fitted so that the hole in the neck of the flask coincides with the hole in the side tube and then the side tube is connected with a vacuum pump by means of a rubber tube. When the desired vacuum is obtained, the cap is slipped around from the hole in the neck of the flask (thus securing complete sealing) and then the flask is disconnected from the vacuum pump. Two modifications of the flask are also described in the paper.—Pharm. Zent., 61 (1920), 470.



Fig 14.

STERILIZATION

Sterilization in Dispensing.—*How to Overcome Indifference Concerning.*—A. W. Linton directs attention to the carelessness of pharmacists where sterile preparations are demanded. It amounts to criminal negligence. Colleges should set about teaching the importance of sterilization. The journals must be depended on to educate those who are out of college. State association programs should lend their aid and state examining boards should test the applicant for registration on his knowledge of the subject.—J. Am. Pharm. Assoc., 9 (1920), 589. (Z. M. C.)

Catgut.—*Iodinizing.*—H. Braun points out that the sterilization of catgut with iodine must be done with caution; otherwise the strength of the catgut is seriously impaired. A one per cent. aqueous solution of iodine (with potassium iodide) impairs the catgut; due most likely to the presence of hydriodic acid. A 0.1 per cent iodine solution, on the other hand, does not lessen the strength of the catgut.

The following substances injure catgut: acids, benzol, methyl alcohol and ethylene trichloride. In the case of some of these solvents the acids present in the crude forms may be the cause of their harmful effect upon catgut. Pure xylol, toluol, cumol and chloroform do not effect catgut and these four afford good solvents for iodine in preparing iodinized catgut.—Melsunger Med.-pharm. Meth., through Pharm. Zent., 61 (1920), 436.

CONTAINERS

Glass.—*English Manufacture of.*—W. E. S. Turner states that the American glass industry and its advancement over the English. America is nearly self-supporting in respect to articles of glassware. The efforts of America are directed to mass production and specialization which have been made possible through the application of aromatic mechanical devices. The American glass industry is divided into two main sections, the first comprising those branches in which glass is melted in pot furnaces and second those in which tank furnaces are used.

Turner proceeds to describe these methods, and also compares them to the English. A description of the various machines used is given and the author lays stress upon the importance of the cost of fuel in the manufacture of glass. In conclusion, Turner says, "the Americans have shown in the glass industry such ingenuity and cleverness, such freshness of ideas and patience in working them out as to provide an object lesson for the rest of the world."—J. Soc. Chem. Ind., 39 (1920), 429R. (H. M.)

Glass.—*English Manufacture of.*—M. W. Travers states that the exigencies of the war made it necessary for many British glass manufacturers to produce goods and materials which had been previously imported from Germany, and which were indispensable in war or peace. What was accomplished under the circumstances was a matter worthy of pride, but, the author warns, much must be done by British manufacturers if they wish to retain the position that they have won in this particular field. The industry can only be effective if every nerve is strained to reach the highest pitch of efficiency, for it is certain that the German manufacturers will also strain every nerve and effort to win back the position that they formerly held. It must be remembered that they still have their factories, which are in fairly good working order, much of their trained labor and management, and what is of the greatest importance, they have a wonderful store of knowledge and experience. The bringing of manufacturers together in the formation of trade associations will do much to promote that spirit of co-operation which is so essential for the success of any enterprise, especially the scientific investigation of glass. He points out that many experimental methods have yet to be developed. While much was done that compares favorably with foreign goods yet there is great room for improvement.—Am. J. Pharm., 92 (1920), 118. (J. K. T.)

Cork.—*Its Origin and Use.*—The Armstrong Cork Company furnishes data for the compilation of an interesting and instructive article under this title. Cork was recognized by the ancients as peculiarly suited for certain uses and nothing yet has

been discovered to displace it in its wide sphere of usefulness. History shows that cork was used as a stopper for wine jars as early as 100 B. C. With the advent of glass bottles in the fifteenth century the cork industry was given great impetus. $5,000,000 worth of crude and manufactured cork are now imported annually into the United States. The cork comes from the countries bordering the Mediterranean sea. The forests cover an area of four to five million acres. A description of the cork oak is given. The first cork is removed from the tree at the age of five years, but the best bark is not yielded until the tree is forty years old. The process of stripping the bark is described in detail. Each tree will yield from forty-five to five hundred pounds. The waste in cork cutting amounts to sixty-five per cent of the raw material. However, every particle of this waste material is made up into numberless products of great value.—N. W. Drug., 28 (1920), 381. (C. M. S.)

Corks.—*Making Acid Resistant and Air Tight.*—The corks are first digested at 44 to 48° in a mixture of 15 grammes of gelatin, 24 grammes of glycerin and 500 mils of water. After drying in the dark, they are then dipped at 40° in a fused mass of 2 parts of petrolatum and 7 parts of paraffin.—Pharm. Zent., through D-A. Apoth. Ztg., 40 (1920), 144.

Cork.—*Portuguese Production of.*—W. L. Lowrie states that the world production of corkwood is 396,832,000 pounds, of which 45 per cent is produced in Portugal, 30 per cent in Spain, 5 per cent in France and Italy, and 20 per cent in Algeria and Tunis. For the present Portugal is the largest producer of corkwood, and probably will maintain its position for several years more. In some districts of Portugal the quality of the corkwood is superior to that of other countries. The forests in Algeria and Tunis, the exploration of which began recently, may produce larger quantities of corkwood in the future. The same is true of Morocco, whose extensive forests will enable it to become the first producing country of corkwood in the world.

The greater part of corkwood is used in manufacturing cork stoppers and cork disks. Cork waste is employed in making linoleum, for which purpose virgin corkwood is also used.

The principal importers of Portuguese corkwood are: England, which imports ready made cork stoppers; France, South America, United States and Germany. They import chiefly corkwood, and the cork stoppers are made in the importing countries. Portugal manufactures 25 to 30 per cent of its corkwood into cork stoppers; Spain, 70 to 80 per cent; and France, the whole continental and a small part of colonial production.—Am. Drug., 68 (Feb., 1920), 30.

Ampuls.—*Changes in Morphine Solutions in.*—Dezeine has investigated the conversion of morphine hydrochloride in aqueous solution into oxy-dimorphine. This change occurs to some extent when the solution is sterilized in sealed ampuls. He found that conversion did not occur when the solution was slightly acidified or when neutral glass was used for the ampuls. He concluded from this that the cause of the change is dissolved alkali from the glass.—J. Pharm. Belg., through Pharm. Era, 53 (1920), 334.

TECHNICAL RECIPES AND HINTS

Aluminum Flares.—E. H. Brittain brings out the fact that this metal is used in various signal lights. It is used in the form of fine powder similar to the aluminum bronze used in making paints. For pyrotechnic purposes it is mixed with barium or potassium nitrate and other ingredients in more or less varying proportions, according to the particular purpose to which the flare may be needed. The powder must be very fine, capable of passing through a 120 mesh sieve, and free of oil, grease or soap. Must also be free of grit, sand, or other impurities. It is said that the powdering of aluminum possesses considerable danger, as spontaneous combustion is liable to occur. Quite a number of formulas are given, a typical one being the following, which is termed a "star composition":

Magnesium in powder (60 mesh)	27 parts
Aluminum in powder (120 mesh)	9 parts
Barium nitrate (100 mesh)	58 parts
Paraffin wax	6 parts

An excellent flare, slow in burning, but giving a good light, and used in revealing enemy working parties, is made up as follows:

Barium nitrate	55 parts
Aluminum	20 parts
Potassium nitrate	4 parts
Sulphur	20 parts
Shellac, powdered	1 part

If too much shellac is used, the flare loses its brilliancy. These mixtures, though less sensitive than gunpowder, must nevertheless be regarded as explosives. In their handling friction and glancing blows must be avoided.—Am. J. Pharm., 92 (1920), 42. (J. K. T.)

Auto Wind Shield.—*Keeping Clean.*—H. Snipe describes a method of obtaining a clear view through the wind shield of an automobile even in the wettest weather. The following solution is applied to the wind shield:

Sodium chloride	1 dram
Water	1 ounce
Glycerin	2 ounces

A little of this is placed on gauze and wiped over the glass in a very thin layer, but always in a downward direction. This is a boon on a wet night on a dark road.—Brit. Med. J., through Am. Drug., 68 (Apr., 1920), 14.

Beverages.—*Fake Orange.*—Oranges possess value other than that which can be measured by flavor or fuel value. They are relied on as antiscorbutic by a large number of persons in the preparation of food mixtures which for some reason are deficient in this protective element. Oranges merit additional favor because they are relatively rich in the water-soluble vitamine B, sometimes designated antineuritic vitamine, which promotes well-being in as yet an undetermined way. In view of these facts, the chemists of the U. S. Public Health Service have done well in their timely warning against the "fake" orange beverages that have come to their attention. They report that in most cases the fraudulent products consisted of carbonated

water, flavored with a little oil from the peel of the orange and artificially colored to imitate orange juice.—J. Am. Med. Assoc., 75 (1920), 1073. (W. A. P.)

Cement for Marble.—A broken marble slab can be cemented together by use of a paste made by mixing 12 parts of Portland cement, 6 parts of slaked lime, 6 parts of fine sand and 1 part of infusorial earth with enough solution of sodium silicate to make the required consistence.—Apoth. Ztg., through D-A. Apoth. Ztg., 40 (1920), 164.

Composition Powder.—E. J. Hughes gives a résumé of the literature pertaining to this preparation which is official in the N. F., which is of value historically in that it shows such a varied list of formulas for this one-time popular remedy. The origin of this powder is due to Dr. Samuel Thompson, who was the founder of a medical sect known as Botanic physicians. The term "Composition Powder" probably originated because of his frequent prescribing of it for nearly all the ill that "flesh is heir to," and his referring to the mixture as this "composition." In a book published by him in 1825 entitled "New Guide to Health" he gives the formula under the title "Composition or Vegetable Powder" which is as follows: bayberry root bark, 1 pound; hemlock bark, 1 pound; ginger, 1 pound; Cayenne pepper, 2 ounces; and cloves, 2 ounces. In a subsequent edition the hemlock bark was omitted.—Am. J. Pharm., 92 (1920), 95. (J. K. T.)

Dentifrice Recipes.—Believing that physicians and dentists who desire to prescribe non-proprietary mouth washes and tooth preparations should have such formulas available in the National Formulary, Bernard Fantus and Clyde M. Snow enumerate what they believe to be fundamental principles for guidance in constructing such formulas. They also propose a formula for a liquid dentifrice and one for a dentifrice powder.—J. Am. Pharm. Assoc., 9 (1920), 1102. (Z. M. C.)

Hand Cleaner.—Ivory soap, 750 grammes; sodium carbonate, 20 grammes; hot water, 120 mils. Reduce the soap to fine shavings, and add to the hot water in which the sodium carbonate has been dissolved. Heat the mixture in a water bath

until soft, then add: Powdered pumice stone, 200 grammes, powdered talc, 50 grammes, and oil of sassafras, 1 mil. The pumice stone should be in the form of very fine powder.—Cal. Ret. Drug. J., through Pharm. Era, 53 (1920), 306.

Hair Dressings.—The following formulas are published in the *Journal of the National Association of Retail Druggists:*

SAGE AND SULPHUR COMPOUND

Sage leaves	1 oz.
Henna leaves	½ oz.
Milk of sulphur	3 oz.
Tincture of cantharides	2 oz.
Oil of bergamot	1 dr.
Oil of lemon	2 dr.
Glycerin	16 oz.
Boiling water, to	1 gal.

Pour the boiling water over the sage and henna and let stand until cool, then strain. Add the oils to the tincture of cantharides and then to the glycerin. Put the sulphur into a mortar and add the mixture of glycerin, oils and tincture to it to make a smooth paste. Finally stir this paste into the decoction of the leaves. This preparation will show a precipitate on account of the insolubility of the sulphur and will have to be dispensed with a shake label.

SAGE HAIR DRESSING

Fluidextract of sage	8 oz.
Tincture of green soap	7 oz.
Tincture of cantharides	1½ oz.
Glycerin	4 oz.
Menthol	2 oz.
Bay rum	16 oz.
Oil of bergamot	4 dr.
Oil of sweet orange	4 dr.
Alcohol	2 pt.
Water, to	1 gal.

Add the oils and menthol to the alcohol, mix the glycerin with the fluid extract and add to the first solution. Add the bay rum and lastly the water in divided portions, shaking after each addition.—Am. Drug., 68 (Feb., 1920), 30.

Hair Dye.—*Poisonous.*—Thompson reports case of chronic aniline poisoning, manifesting all of the typical symptoms, which followed the use of a French hair dye called "goutte à goutte." The mixture consisted of paraphenophendiamine 2 per cent., hydrogen dioxide, 75 per cent., and alcohol, 23 per cent. The author points out that the menace of aniline hair dyes has not yet sufficiently been emphasized to be appreciated generally by the medical profession. The fact that personal susceptibility varies as much as in the case of poisoning, for example, by rhus toxicodendron, only makes it more difficult always to recognize such cases.—Med. Rec., through Pract. Drug., 39 (Aug., 1920), 36.

Flavoring Extracts.—*Non-Alcoholic.*—M. De Groote states that flavors can be extracted from the vanilla bean and other substances without the aid of alcohol as a solvent. He alleged that glycerin could be used as a substitute.

Dr. De Groote developed the fact that vanillin and coumarin, the active principles of the vanilla and the tonka beans, respectively, could be extracted in glycerin solutions, so that extracts of flavors could be prepared not only equal to Federal requirements in strength, but even stronger and without the use of grain alcohol in any manner.

"Such extracts," he said, "will withstand freezing weather, and are low in cost. They can be prepared with the same equipment as is employed in the manufacture of alcoholic extracts, and are entirely acceptable from a hygienic standpoint. Glycerin extracts have been tried on large scale, and household tests, and have proven to be entirely satisfactory."—Pract. Drug., 39 (Nov., 1920), 38.

Inks.—"Concerning Inks" is the title of a Government Bulletin, in which the History of Inks, their composition and manufacture is set forth. This bulletin gathers together the mass of information scattered throughout chemical literature and places

it in a very condensed and instructive article, where it may be easily accessible to anyone desirous of it, from the Superintendent of Documents, Government Printing Office, Washington, D. C., at five cents per copy. This article first treats of the history of ink which dates back to 2500 B. C. It then discusses the manufacture and composition of inks, under which heading come the many different kinds, each of which is described particularly.—Drug Circ., 64 (1920), 368.

Ink.—*Chinese.*—Chinese ink is sometimes erroneously called "India ink." It is made of the lampblack of sesame, rapeseed, or wood oil, to which are added varnish and pork fat. This paste is then mixed with glue, musk, or Baroos camphor to scent it, and some gold leaf to give it a metallic lustre. It is pressed in carved wooden moulds, or beaten in wooden anvils with steel hammers, and then pressed into moulds. The best ink comes from wood oil lampblack, collected on the sides of a second earthen jar placed above the one in which the oil is slowly burnt. Anhui Province produces the best ink. There are many grades, the cheapest being produced from coarse soot and glue. China exported during 1917, 116,000 pounds of Chinese ink, valued at 73,000 taels; in 1918, 127,000 pounds, valued at 78,000 taels.—J. Roy. Soc. Arts, through Pharm. Era, 53 (1920), 79.

Indelible Ink.—*For Rubber Stamps.*—Mix together 20 parts of copper sulphate and 30 parts of aniline hydrochloride; then add 10 parts of dextrin and 5 parts of glycerin; triturate well adding enough water to make it thin enough for use.—Chem. Markt., through Pharm. Zent., 61 (1920), 530.

Ink Eraser.—*In Pencil Form.*—Fourteen parts of powdered pumice, 2 parts of sandarac, 1 part of tragacanth and 1 part of dextrin are made into a mass with mucilage of acacia and then rolled into sticks and dried.—Sudd. Apoth. Ztg., through Pharm. Zent., 61 (1920), 666.

Ink Stains.—*Removal of.*—Gerhardt found that an ink-stain on cotton which could not be removed by either oxalic acid, oxalic acid and sodium chloride, or oxalic acid and zinc dust, yielded

to potassium permanganate solution, followed by sodium thiosulphate and citric acid. On thorough washing no trace of the stain remained.—Z. angew. Chem., through Drug. Circ., 64 (1920), 180.

Galenicals.—*Variation in Color of.*—G. E. Ewe points out that variation in the color of pharmaceutical preparations may be due to any one of a number of causes, such as, variation in color of the leaves of some plant drugs; variation in proportion of extractive matter in plant drugs; the application of heat; the use of proper utensils (causing chemical changes)—light, air, etc. He urges, in closing, that color be not depended upon to too great an extent and further says that chemical and physiological standardization, and not color, are the scientific and trustworthy tests of quality of pharmaceutical preparations.—Drug. Circ., 64 (1920), 281. (L. N. B.)

Glutolin.—*A New Adhesive.*—This is a German adhesive prepared from bone gelatin and found well adapted for use in manufacturing various forms of paper products.—Pharm. Zent., 61 (1920), 67.

Laboratory Notes.—George E. Ewe contributes some valuable information. The phenol coefficient of crystallized oxalic acid is 10 to 11 but because of its toxicity its use should be limited to disinfection where it cannot possibly come in contact with people or animals. Denigè's test is excellent for detection of citric acid in many common mixtures. Upon ignition of cocaine hydrochloride there is an odor similar to that obtained by the U. S. P. VIII., identification test for atropine. The author discusses Benedict's method for the estimation of reducing sugars under these heads: rate of obtaining the end reaction; accuracy of the method; application of the method to sucrose-dextrose mixtures. A commercial disinfectant with a phenol coefficient of 12.7 was found to be chiefly caustic soda which fact would limit its use to those materials that could withstand caustic alkali. Phenol sometimes shows a liquid portion at top of container and this may have a congealing point as low as 25° C. instead of 38° C. specified by the U. S. P. After determining the

congealing point of the rest of the phenol this liquified portion might be incorporated providing it would not reduce the congealing point of the whole below 38° C.

"Leche de Higueron" is the sap of a Central American plant and is used in the treatment of hook-worm. Analysis of it showed no constituent that might account for its claimed efficacy in hook-worm disease. *"Buta,"* a drug used in Peru, was found to increase the blood pressure. *"Golendrina"* employed in Texas in the treatment of dysentery may owe its value to the presence of considerable tannin. A commercial lecithin, 91.6 per cent strong and selling at $2.10 per ounce would require 80 eggs for its production. A "Plant Lotion" from Porto Rico used for sprains and bruises is apparently a dilute alcoholic extraction of an undetermined plant. Nothing was found to warrant the claims for it. Molasses ash was found to contain 27.4 per cent of metallic potassium, tobacco stems and dried apple peelings contained 3.13 per cent and 0.828 per cent respectively.—J. Am. Pharm. Assoc., 9 (1920), 1178. (Z. M. C.)

Laboratory Deodorant.—Sodium bicarbonate, 5 ounces; alum, 5½ ounces; potassium bromide, 4 ounces; hydrochloric acid, enough; water, enough to make 4 pints. To 3 parts of boiling water add the alum and then the bicarbonate. Introduce enough hydrochloric acid to dissolve the precipitate of aluminum hydroxide which forms and then add the potassium bromide. Add enough water to bring the measure of the finished product up to 4 pints.—Pharm. Era, 53 (1920), 306.

Luminous Paints.—V. Renneboog describes the production of phosphorescent zinc and calcium sulphides and their uses as luminous paints. He points out that no phosphorescence is possible with these substances without the action of an outside agent, such as irradiation, heat, ozone, or exposure to ultraviolet, Roentgen or Becquerel rays. He then discusses the successful use of radium as such an excitant.—Chem. & Drug., 192 (1920), 972.

Massage Cream.—*Rolling.*—G. E. Ewe recommends a recipe calling for casein, a base, boric acid, pink coloring and a perfume.

The base consists of glycerin, stearic acid, corn starch, ammonia water and water.—Drug. Circ., 54 (1920), 174. (L. N. B.)

Paper.—*Impermeable.*—For rendering paper impermeable it is recommended to saturate it with a hot mixture of 50 parts of rosin, 45 parts of paraffin and 5 parts of sodium silicate, removing the excess of the liquid by allowing the paper to run through a pair of warm rollers. By varying the quantities of rosin and paraffin (the percentage of sodium silicate should always remain the same) a more or less hard paper is obtained; thus by increasing the rosin 5 to 10 per cent. a paper suitable for roofing and other out-of-door purposes is made. For making impermeable packing paper it is recommended to replace the above liquid by a mixture of a solution of one kilo of soap in one kilo of a 10 per cent. potassium dichromate solution and a solution of 0.25 grammes of carpenter's glue in one kilo of water.—Rev. Chim. Ind. through Drug. Circ., 64 (1920), 191.

Perfumes.—*Fixing in Solids and Liquids.*—A German patent claims that tests have shown that etheric oils or other similar volatile perfumes can be fixed in perfume vehicles and the evaporation be more or less prevented if tannic acid or tannic acid salts, particularly of the alkalies and of ammonium, are added. Further, an addition of sugar appears to be useful. It mixes at once with the tannic acid or with the etheric oil, or with a combination of both. Gallic acid may be used in place of tannic acid. To produce artificial cinnamon, 2 parts by weight of cinnamon oil are intimately mixed with 2 parts of tannic acid and 16 parts of sugar; and to the mixture 40 parts of rolled potato flour and 40 parts of Swedish turnip flour are added.—Perf. Ess. Oil Gaz., through Am. Drug., 68 (Apr., 1920), 28.

Postage Stamps.—*Danger in Licking.*—Diner and Horstman obtained postage stamps from fifty different places, note being made in each case whether the stamps were kept exposed on the desk or held for sale in a drawer or cash register. Laboratory tests showed that no stamp was free from germs. Twenty of them contained colonies too numerous to count. Among the germs were colon bacilli, staphylococci, streptococci, pneumococci and diphtheroid bacilli. Apparently there was little difference in bacterial content between the stamps exposed on the

desk and those kept in drawers. The amount of danger presented by these organisms cannot be stated, as, unfortunately, no tests were made to determine the virulence of the germs. In commenting on these results, *American Medicine,* while not encouraging the common practice of moistening stamps with the tongue, points out that if stamps were a grave source of infection a very large percentage of the population would undoubtedly be suffering from infections due to this cause. The fact is that most oral cavities will reveal the presence of some or all of the organisms above mentioned, whether stamps have been licked or not.—Med. Times, through Pract. Drug., 39 (Feb., 1920), 37.

Rat Poisons.—Thomas Parker points out that while phosphorus, arsenic and strychnine are excellent rat-killers, their extremely poisonous character renders their general use unsafe. For this reason, he prefers the less poisonous rat exterminators, barium carbonate and squill. Barium carbonate should be mixed with an equal weight of tallow and spread on bread, which is then made into "sandwiches" and cut into small squares. Powdered squill can be used likewise in "sandwich" form or else a fluid extract may be mixed with an equal volume of milk; and to a pint of this fluid add 1 pound of bread.—Austral. J. Pharm., through Am. J. Pharm., 92 (1920), 741.

Specialties.—*Composition of Certain.*—G. E. E'we publishes his analyses of (a) a linoleum dressing; (b) three embalming fluids; (c) flashlight for color photography; (d) non-inflammable cleansing fluid; (e) a rat exterminator; (f) a cleansing toilet cream; (g) a cuticle remover; (h) a silver-grey hair dye; (i) a fly and lice spray; (f) three insecticides; (k) a liquid disinfectant; (1) a toilet hopper cleaner; (m) a germ and odor killer; and (n) a canning preservative. For details, consult the original paper.—Pharm. Era, 53 (1920), 99.

Sponges.—*Collection in Tunisan Waters.*—U. S. Consul H. N. Cookingham reports that a very fine quality of sponges is being gathered around the Kerkenna Islands. Tunis.—Am. J. Pharm., 92 (1920), 140.

Stains.—*Removal of.*—An extended article deals with the treatment of the following stains: grease spots; milk and cream stains, including ice cream; chocolate and cocoa stains; coffee stains; egg stains; fruit and berry stains; stains of grass or green foliage; ink spots on clothing; ink spots on the carpet; perspiration stains; iron rust spots; tobacco stains; paint and varnish stains.—Mich. Food and Drug. Month., through Bull. Pharm., 34 (1920), 66, 68. (C. M. S.)

Surgical Dressings.—Elmer H. Hessler enumerates the common materials used in surgical dressings and gives the standards which they should meet. He emphasizes the necessity of sterilization and describes ways of obtaining it.—J. Am. Pharm. Assoc., 9 (1920), 1090. (Z. M. C.)

C—PREPARATIONS

CAPSULÆ

Soft Gelatin Capsules.—R. C. White presents an admirable paper on the manufacture of soft gelatin capsules. Not only does he give details of manipulation including illustrations of machinery used but he also discusses the type of help best suited for this none too attractive task.—Proc. Pa. Pharm. Assoc., 43 (1920), 282.

Capsules and Konseals.—*Use of.*—D. C. O'Connor discusses at considerable length the use of konseals and capsules in the dispensing of prescriptions. Mixing and dividing medicines into doses to be placed in konseals are first treated. Suggestions are made which are helpful in the accurate dispensing of minute quantities of powerful drugs. Methods for massing mixtures to be placed in capsules are next described. Comment is made on the dispensing of liquids in hard capsules. Tables are included which show the approximate weights of many drugs which can be dispensed in the various sized konseals and capsules. Eighteen typical prescriptions are presented and the methods for compounding them critically discussed. Seven

cardinal principles are laid down concerning the use of konseals and capsules.—Spatula, 26 (1920), 129. (C. M. S.)

CARBASUS

Pyoktanin Gauze.—E. L. Blumann highly recommends pyoktanin gauze as an antiseptic dressing for infected wounds. —Therap. Gegenw., through Pharm. Ztg., 65 (1920), 511.

Sublimate Gauze.—*Assay.*—F. B. Kilmer recommends the following method: pack 100 grammes of the substance tightly in a percolator. Add warm water acidulated with about 1 per cent concentrated hydrochloric acid, in small portions, until 600 mils percolate is secured. Percolate slowly (about half hour). Cool this solution to about 60° F. and pass in hydrogen sulphate to precipitate mercuric sulphide. Let stand several hours if possible, and decant through a weighed filter, collect, wash, dry—wash with about 50 mils carbon bisulphide and weigh as mercuric sulphide. Then calculate as mercuric chloride. —Am. Drug., 68 (Apr., 1920), 18.

Plaster Mulls.—*Preparation of.*—A. W. Gerrard proceeds as follows: Soft, open weave bandage material is proofed by coating with a rubber paste (rubber 1 in benzol 10) to prevent the plaster soaking through the mull. Aluminium oleate is recommended by Unna as a vehicle for the active ingredient but the writer favors a paste of rubber, wax and benzoinated lard as more readily manipulated and adjusted for consistency and adhesive properties. This paste consists of rubber in benzol (1:10) 5 oz., white wax 1 oz., benzoinated lard 3½ oz. The wax and lard are melted and intimately incorporated with the rubber paste. Formulæ for salicylic acid mulls are given in the paper. Salicylic acid in combination with creosote, the latter being used as an anodyne, is a popular combinaton. A mercury mull containing 55 per cent of the metal can be readily prepared.—Pharm. J., 105 (1920), 100. (C. W. B.)

COLLODIA

Collodion.—*Preparation of.*—Keuleman's found that the moisture in the gum cotton should not be removed by heating at 40 to 45° but by extracting with alcohol, because cotton dried by the former process is not always clearly soluble in ether. E. J. Van Itallie found that if the process of drying is used, the temperature should not exceed 25 to 30°.—Pharm. Weekblad., 57, (1920), 677. (H. E.)

ELIXIRIA

Elixir?—*What is an.*—X-rayser II attempts to answer this question from the historical standpoint. Originally it had a purely medicinal meaning that it was a drying powder for wounds, which is soon lost; but even this is not proved, and it is impossible to dissociate the term from its use in alchemy, in which it is virtually synonymous with the philosopher's stone. This "stone" is itself so illusive as to baffle description, and anything like a definition of it is impossible. Confining my inquiry to British pharmacy, I am almost equally at a loss for a definition of "elixir." That given by Bailey in 1736—"A compound magistery, *i. e.*, a composition of various bodies changed after the same manner as a single body"—conveys no definite meaning to my mind, and his later one—"A very fine and useful tincture . . . .where the ingredients are almost dissolved in the menstruum, and give it a thicker consistence than a tincture"—does not accord with the facts. Johnson gives five definitions, of which one follows Bailey and one is no definition at all, being simply "Any cordial." There were no elixirs in our first two Pharmacopœias; when introduced they were classed with tinctures, and in some cases the terms "tincture" and "elixir" were used interchangeably, but the word "elixir" was dropped in 1788 and has been revived only during the last half-century.—Chem. & Drug., 93 (1920), 1699.

Aromatic Elixir.—*Improved.*—Geo. M. Beringer, Jr., suggests the addition of 20 mils of oil of cassia to each liter of compound spirit of orange.—Proc. N. J. Pharm. Assoc., 50 (1920), 37. (J. H.)

Aromatic Elixir.—*Iso-Alcoholic Fluid for.*—Bernard Fantus believes that aromatic elixir ought to be "of an alcoholic strength adjustable to the requirements of the medicaments for which it is to serve as a vehicle." He submits the following modified formula.

Compound Spirit of Orange	10 mils
Syrup	375 mils
Purified Talc	30 Gm.
Alcohol	50 mils

Distilled water, a sufficient quantity to make 1,000 mils.

Mix the compound spirit of orange with the alcohol. To this solution add the syrup in several portions, agitating after each addition, and afterwards add in the same manner 560 mils of distilled water. Mix the purified talc intimately with the liquid, and then filter through a wetted filter, returning the first portions of the filtrate until a transparent liquid is obtained. Lastly wash the filter with a 5 per cent. solution of alcohol in distilled water until the product measures 1,000 mils.

When used as a vehicle it may be mixed alcohol in proportion to correspond approximately with the alcoholic strength of the medicinal substance with which it is to be used.—J. Am. Pharm. Assoc., 9 (1920), 708. (Z. M. C.)

Alkaloidal Elixir of Cinchona.—*Modified Recipe.*—At the 1920 meeting of the New Jersey Pharmaceutical Association, A. F. Marquier submitted the following:

Quinine sulphate	2.0
Cinchonidine sulphate	1.0
Cinchonine sulphate	1.0
Oil of cassia	.5
Oil of caraway	.25
Oil of anise	.25
Oil of coriander	.25
Oil of orange	1.0
Compound tincture of cardamom	30.0
Alcohol	250.0
Glycerin	50.0
Syrup	375.0

Dilute Sulphuric Acid	2.5
Water to make	1000.0
Talc	10.0

Dissolve the oils in the alcohol, add the alkaloids, the acid, glycerin, syrup, compound tincture of cardamon and water, lastly the talcum and filter.—Proc. N. J. Pharm. Assoc., 50 (1920), 100.

EMPLASTRA

Adhesive Plaster.—*Removing.*—Abbe and Dickinson point out that the removal of plaster strapping from surgical wounds is a troublesome process for the dresser and painful for the patient. The use of alcohol has been recommended as a solvent of the adhesive, but this is in itself likely to give rise to much pain. Gasoline is an excellent solvent, enabling the plaster to be stripped off without any discomfort. The tip of a corner of the plaster is scratched up with the finger-nail, and a drop or two of gasoline introduced between the skin and the raised surface. An inch or two of the plaster can then be raised at once and a further portion of gasoline introduced by means of a pipette or medicine dropper. In this way a plaster dressing may be removed daily, if necessary, without occasioning the least distress to the patient.—J. Am. Med. Assoc., through Pharm. J., 105 (1920), 379.

EMULSA

Emulsions.—Briggs, Du Cassé and Clark discuss the physical chemistry of emulsions. Emulsions of oil and water may be made by grinding the two together in a mortar in the presence of a finely divided solid which is easily wetted. The finely divided solid serves to increase the area of the interface between oil and water and is more effective if suspended in the oil before adding the water. In the "Continental" method of preparing emulsions gum arabic acts both as finely divided solid and as emulsifying colloid. Emulsions of water in oil may be made in a mortar by using finely divided solids easily wetted by oil.—J. Phys. Chem., through J. Soc. Chem. Ind., 39 (1920), 341A.

Emulsions.—*A Review of the Literature of.*—Arthur W. Thomas presents a review of the literature dealing with emulsions, both of the "oil in water" and "water in oil" types; emulsifying agents, and means of breaking emulsions. Owing to the nature of the data presented, the reader should consult original article. —J. Ind. Eng. Chem,, 12 (1920), 177. (L. A. B.)

Emulsion of Benzyl Benzoate.—E. T. Brown recommends the preparation of a 20 per cent emulsion of benzyl benzoate containing 2 grammes of tragacanth in 100 mils. To mask the disagreeable taste of benzyl benzoate, he adds to each 100 mils of the emulsion 12 drops each of methyl salicylate and of oils of sassafras and sweet orange.—Am. J. Pharm., 92 (1920), 800.

Emulsion of Liquid Petrolatum.—H. B. Stevens suggests the following recipe; powd. acacia, ¾ oz.; phenolphthalein, 30 grs.; liquid petrolatum, 3 fl. oz. Mix, and add all at once, with brisk stirring—peppermint water, 1½ fl. oz. When a perfect primary emulsion is obtained add, a little at a time, with constant trituration, until the whole is incorporated—liquid petrolatum, 3 fl. oz. The result is a perfect thick cream which may be dispensed in a covered pot.—Pharm. J., 105 (1920), 226.

EXTRACTA

Extract of Belladonna.—*Mydriatic action compared with that of atropine sulphate.*—Atropine sulphate solutions exert a stronger mydriatic action than solutions of extract of belladonna with the same amount of alkaloids. H. Kunz-Krause ascribes this to the presence of substances in the plant such as tannoids, pectins, etc., which act as "pharmacologically protecting colloids" and prevent the extract from being readily absorbed by the lacrimal fluid. (See also page 230)—Kolloid Zsch., through Pharm. Weekbl., 57 (1920), 355. (H. E.)

Extract of Ergot.—*Tests for.*—C. Glücksmann suggests the following tests which can be applied to the evaporated fluidextract or to the extract.

1. As in the case of all amino acids, the aqueous solution gives with ninhydrine (1-1000) solution a violet to blue color.

2. An aqueous solution with 1 to 2 drops 10 per cent ferric chloride solution does not produce a brown color. Extracts of belladonna, hyoscyamus, condurango and glycyrrhiza turn green, blue or brown when so treated.

3. An aqueous solution, gives precipitates with alkaloidal reagents, such as mercuric chloride solution.

4. An aqueous solution made alkaline with ammonia and shaken with ether, gives an ether extract, which upon evaporation of the solvent gives a blue-violet color with strong sulphuric acid containing a trace of ferric chloride.—Pharm. Press., through Pharm. Zent., 61 (1920), 86.

Extract of Nux Vomica.—*Manufacture of.*—Nordström criticises the method prescribed by the Swedish Pharmacopœia of preparing extract of nux vomica from coarsely powdered seeds. He found that 5,000 grammes of nux vomica, with a content of 2.86 per cent of alkaloids, representing a total of 142.5 grammes of total alkaloids, yielded 570 grammes of extract with a content of 16 per cent of total alkaloids, but the total amount present is only 91.2 grammes, so that no less than 51.3 grammes of alkaloids were lost in extractions. He recommends the use of finely powdered nux vomica for the preparation of extract and tincture of nux vomica.—Apoth. Ztg., through Chem. & Drug., 93 (1920), 1210.

FLUIDEXTRACTA

Fluidextracts and Tinctures.—*Function of Glycerin in.*—Wilbur L. Scoville directs attention to the fact that we do not understand how glycerin acts to prevent precipitation, whether it is by its solvent action, by retarding chemical change or by the increased viscosity. Neither do we know whether it is most effective when placed in the menstruum or added after percolation. Mr. Scoville reports the result of an investigation of this question covering twenty-seven fluidextracts and tinctures of the U. S. P. and the N. F. He classifies them under alkaloidal drugs, cathartic drugs, astringent drugs and miscellaneous, describing carefully the work done.

The experiments indicate that there should be a distinction between glycerin as a solvent and as a stabilizer. Sugar may

add stability in some cases just as well as glycerin. Used as a solvent glycerin retards extraction in calisaya, hydrastis (alkaloidal); rhubarb, geranium and rose (containing tannin); apocynum and uva ursi. It aids extraction of red cinchona, butternut, hamamelis, krameria and nutgalls. On the other drugs represented glycerin shows no appreciable effect. "As a stabilizing agent, to prevent precipitation, glycerin is shown to be effective on ten of the drug preparations, viz., red and yellow cinchona, geranium, hamamelis, hydrastis, krameria, nutgall, columbo, sarsaparilla compound and uva ursi." It does not entirely prevent precipitation in any case. Sugar hinders precipitation sometimes but usually not as well as glycerin though in two or three cases it seems more efficient. Glucose acts similarly but is not desirable because it reduces alcoholic strength.—J. Am. Pharm. Assoc., 9 (1920), 868. (Z. M. C.)

Fluidextracts.—*Constants for Swedish.*—H. Haine reports on the density and amount of dried extract obtained from thirteen of the fluidextracts of the Swedish Pharmacopœia. As these fluidextracts are not necessarily prepared with the menstrua directed by the U. S. P., the constants are not repeated at this place.—Farm. Revy., through Pharm. Zent., 61 (1920), 673.

Fluidextract of Ipecac.—*Preparation of.*—In spite of the frequent changes in method of manufacturing this fluidextract it is not yet permanent and at the same time suitable for preparing syrup of ipecac. After a review of the literature and some experimental work, Frantz F. Berg concludes that exhaustion of the drug is hastened by moistening it with warm hydrochloric acid and that 71 per cent alcohol is the best solvent for the active principles. The alcohol may be recovered by distillation without danger to the active principles. The finished product is made with 40 per cent alcohol, the resins being left behind, and it is miscible with syrup.—J. Am. Pharm. Assoc. 9 (1920), 598. (Z. M. C.)

INFUSA

Infusions.—*Making Them Right.*—D. C. O'Connor first comments on the prevailing attitude of the average drug clerk

toward infusions then follows with an exhaustive discussion of the proper methods of procedure in dispensing them. In some cases the therapeutic properties and the habitat of the drug are commented on. Ten typical prescriptions accompanied with a description of the methods for compounding each are given. Infusions of the following drugs are dealt with: digitalis, rhubarb, calumba, triticum, scoparius, senna and sarsaparilla.—Nat. Drug., 50 (1920), 20. (C. M. S.)

Infusion of Digitalis.—*Stability of.*—Pomeroy and Heyl state that a study of the stability of aqueous solutions of this drug is important because of its widespread use in practical therapeutics. In arriving at their conclusions showing deterioration of the infusion they used the one-hour frog method as suggested in the U. S. P. They summarize as follows:

1. A comparison of the relative activity of digitalis infusions and tinctures of equal concentration shows that there is a difference, the infusion being slightly less active.
2. The infusions deteriorate.
3. Placing a 20 per cent limit on deterioration: the infusions should be discarded in 3 to 5 days' time. At lower temperatures this time limit may be extended to 6 to 7 days.
4. The addition of alcohol adds nothing to the stability of the infusion.—Am. J. Pharm., 92 (1920), 394. (J. K. T.)

LINIMENTA

Camphorated Oil.—*Preparation of Sterile.*—The 1:10 solution of camphor in olive oil, which is widely prescribed in French practice for administration by hypodermic injection, may, according to E. Cabannes, be easily and effectively prepared as follows: Pure olive oil preserved from contact with the air by means of a layer of alcohol (95 percent) is heated in a long neck flask in a boiling water bath until all the alcohol is evaporated. The oil will be perfectly sterilized by this procedure. The flask is then removed from the source of heat, and when the temperature of the oil has fallen to about 40° the camphor is added and dissolved. If necessary the camphor may first be dissolved in a small quantity of ether. The author has prepared more than 5,000 camphor injections by this method, and has never had a

case showing any ill effects following the administration.—Bull. Soc. Pharm., Bordeaux, through Am. Drug., 68 (May, 1920), 18.

Camphorated Oil.—*Use in Hemoptysis.*—Lunde finds the administration of camphorated oil by hypodermic injection is a most valuable method for arresting pulmonary and other forms of hemorrhage. It is equally efficacious for epistaxis. In eleven successive cases of hemoptysis the hemorrhage was stopped in a few minutes as if a finger had been pressed on the orifice from which the blood was issuing.—Bull. off. int. Hygiene, through Pharm. J., 104 (1920), 28.

Camphorated Oil.—*Use in Sciatica.*—A. S. Jensen finds that in all of his thirteen cases of sciatica treated by injection of 3 or 4 mils of camphorated oil into the affected limb, the pain subsided completely in the course of ten or twelve days. He finds that the method is equally useful in cases of neuritis, the pains subsiding within five or six days.—Ugesk. f. Læger, through Pharm. J., 104 (1920), 6.

Duret's Balsam.—*Recipe for.*—The following formula is given

Balsamum Duret

Pix liquida	18
Oleum juniperi oxycedri	15
Resorcinol	2
Menthol	5
Guaiacol	5
Camphora	40
Sulphur præcipitatum	15
Sodii boras	36
Acetonum	80
Oleum ricini	40
Adeps lanæ	100

Mix the camphor and the guaiacol. Dissolve the sulphur in the tar, castor oil and wool fat by heating to 130°. Mix with the camphor-guaiacol solution and then add the other ingredients.—Schweiz. Apoth. Ztg., 58 (1920), 493.

LIQUORES

Saturated Solutions.—*Preparation of.*—L. G. Freeman discusses the preparation of saturated solutions of potassium iodide, sodium iodide and magnesium sulphate. His results are presented in the following tables:

Potassium Iodide

Salt taken .....10 Gm.	99 Gm.	451 Grains	1 av. 208 Gr.
Water taken..... 7.2 mils.	71 mils.	340 minims	11 fl. oz. 166 min.
Resulting volume .10.15 mils.	100 mils.	1 fl. oz.	16 fl. oz.

Sodium Iodide

Salt taken .....10 Gm.	110 Gm.	502 Grains	18 av. oz. 163 gr.
Water taken..... 5.5 mils.	61 mils.	291 minims	9 fl. oz. 331 min.
Resulting volume . 9.08 mils.	100 mils.	1 fl. oz.	16 fl. oz.

Magnesium Sulphate

Salt taken.....10 Gm.	63 Gm.	287 Grains	10 av. oz. 217 Gr.
Water taken.....10 mils.	63 mils.	302 minims	10 fl. oz. 30 min.
Resulting volume...15.9 mils.	100 mils.	1 fl. oz.	16 fl. oz.

—Am. J. Pharm., 92 (1920), 802.

Alkaline Antiseptic Solution.—*Modified Recipe.*—At the 1920 meeting of the New Jersey Pharmaceutical Association, A. F. Marquier submitted the following:

Menthol	2.0
Thymol	1.0
Oil wintergreen	2.0
Oil pinus pumilio	2.0
Eucalyptol	8.0
Powdered cudbear	15.0
Alcohol	250.0

Allow to stand for 12 hours and filter; add this to a solution of

Sodium bicarbonate	45.0
Sodium biborate	45.0
Sodium benzoate	15.0
Sodium salicylate	4.0
Water, mils	2000.0
Glycerin	750.0
Talcum	15.0

Mix and add sufficient water to make 3000 mils and filter.
Proc. N. J. Pharm. Assoc., 50 (1920), 100.

Solution of Aluminum Aceto-Tartrate.—*Fraudulent.*—A solution of aceto-aluminum tartrate was found to be a 8% solution of aluminum sulphate containing acetic acid.—Schweiz. Apoth. Ztg., 58 (1920), 423. (H. A. L.)

Solution of Aluminum Subacetate.—*Stability of.*—M. Brenner reports his studies of the physical and chemical character of the solution of aluminum subacetate, with the object of obtaining a stable product and recommends that this preparation be made and always kept at a low temperature. It should not even become warm temporarily.

The mixture should stand at least 7 days to insure complete precipitation of the calcium sulphate. The finished product should be kept in concentrated form, in well stoppered bottles to avoid loss of acetic acid. The bottles themselves should be made from alkali-free glass, and contamination with other chemicals should be avoided.

The paper is well worth reading by those interested in this preparation.—Pharm. Zent., 61 (1920), 389. (O. M.)

Solution of Aluminum Subacetate.—*Fraudulent.*—Maue calls attention to the practice of a manufacturer in placing on the market, as Burow's solution, a liquid containing 1 part of solution of aluminum acetate and 3 parts of an 8 per cent solution of aluminum sulphate. The adulteration is of course readily detected by testing for sulphates and determining the aluminum oxide content.—Pharm. Ztg., 65 (1920), 47. (G. C. D.)

Liquor Carbonis Detergens.—During the war this product was prepared in Germany by extracting coal-tar with tincture of soap bark. Since, however, the supply of this drug was soon exhausted other saponin containing drugs were used for extracting the coal-tar and Herscheimer and Altmann found that tincture of horse chestnut, tincture of woodroot, tincture of chamomile, tincture of mullein and tincture of stinging nettle are very suitable for this purpose. The products ob-

tained by the extraction with the first two were lighter in color than the English preparation. When using the third and fourth named tinctures a color was obtained which compared favorably with the English product while the preparation obtained with tincture of stinging nettle was darker than this.—Berl. Klin. Wochenschr., through Pharm. Weekblad, 57 (1920), 353. (H. E.)

Compound Solution of Cresol.—*Disinfectant Properties of.*—E. Hailer finds that the disinfectant properties of cresol are diminished in alkaline solution. Such solutions are ineffective with *Staphylococcus,* but on the other hand they are active to typhus bacilli, and with *B. coli* they are not inferior to cresol soap solution. The alkaline cresol solutions are therefore suitable for use in hospitals etc.; they also have the advantage of cheapness. A mixture of equal parts of 25 per cent sodium hydroxide and cresol diluted with 20 times its volume of water gives the best results.—Arbeit. Reichsgesundh. Amt., through J. Soc. Chem. Ind., 39 (1920), 278A.

Compound Solution of Cresol.—*Assay of.*—Verda modifies the assay method of the Swiss Pharmacopœia for the determination of cresol in *cresolum saponatum* as follows: Follow the official method, only collect the distilled cresol in a Kreis tube and read the volume instead of determining by weight after extraction with ether. The density of cresol is 1.04 to 1.05. If separation of cresol is not perfect shake with 20 grammes of sodium chloride solution and 6 mils of diluted hydrochloric acid are methods gave good results.—Schweiz Apoth. Ztg., 58 (1920), 238. (H. A. L.)

Compound Solution of Cresol.—*Assay of.*—D. Van Os estimates the above preparations as follows: Into a small graduated cylinder of 25 mils content, 4 mils of concentrated sodium chloride solution and 6 mils of diluted hydrochloric acid are placed, then exactly 5 mils of benzene or petroleum ether are added and finally 10 mils of the liquor cresolis compositus. The mixture is then shaken well for 1 minute and allowed to stand for 5 minutes. In a good preparation the lower layer should measure at most 13 mils while the upper layer should measure

at least 12 mils. In the case of formaldehyde soap solution the procedure is as follows: 5 mils of diluted sodium chloride solution, 5 mils of diluted hydrochloric acid, 5 mils of either benzene or petroleum ether and 10 mils of the formaldehyde soap solution are thoroughly shaken and then allowed to settle. The volume of the benzene solution should be at least 7 mils corresponding to 20 mils of soap.—Pharm. Weekblad, 57 (1920), 692. (H. E.)

Solution of Ferric Chloride.—*Presence of Sulphates in.*—Richard and Malmy find that in France many samples of the solution of ferric chloride contained sulphates; one sample examined containing 19 per cent of ferric sulphate and 15.7 per cent of ferric chloride. This shows the need of a test for sulphates in the monograph in the Codex.—J. pharm. chim., 22 (1920), 5.

Gelatin Solutions.—*The Gold Number for.*—The gold number is, according to Zsigmondy, the number of milligrammes of protective colloid which is just insufficient to prevent the color change of a gold solution Au_F to violet or to a violet tint. The change, without the addition of a protective colloid, is produced by 1 mil of a 10 per cent sodium chloride solution. M. I. Schulte found that gelatin solutions lose their protective properties against colloidal gold solutions considerably when heated for any length of time. The gold number consequently becomes considerably higher.—Pharm. Weekblad, 57 (1920), 822. (H. E.)

Homatropine Solutions.—*Substitute for.*—The disadvantages of the use of an aqueous solution of homatropine owing to its cost and the amount wasted when obtaining cycloplegia were the subject of some remarks by Mr. J. Harman at a lecture delivered at the West London Post Graduate College recently. To overcome the waste he suggested an aqueous solution rendered so viscid by the addition of gum arabic that it could be lifted in drops with a narrow probe. This gummy solution must be made antiseptic, and the addition of menthol 2 grains, oil of wintergreen 2 minims, and tincture of iodine 2 minims, to a pint of water makes an efficient preservative. A solution in

castor oil is the most convenient and most active, but needs careful preparation, as if too strongly heated some of the homatropine will be reconverted to atropine, and consequently some of the advantages of the former will be lost.—Chem. & Drug., 92 (1920), 860.

Hypobromite Solution.—*Catalytic Action of Copper on.*—It has long been known that under certain conditions the hypobromite reaction for urea gives high results due to the evolution of oxygen from the hypobromite solution. Philibert (See Year Book 1919, 562) opined that this evolution of gas was due to some impurities in the alkali used, and P. Fleury now shows that copper is the catalytic agent that causes the evolution, as little as 1 part Cu in 4 million bringing about the decomposition of the hypobromite. This decomposition can be prevented by the addition of iodides or iodates and the author suggests that the hypobromite reagent be prepared as follows:

Solution A: Solution of soda, 55 mils; potassium iodide, 0.20 gramme; water to make 100 mils.

Solution B: Bromine, 8.5 mils; potassium bromide, 50 grammes; water, 80 to 82 mils.

Mix equal volumes of the two solutions immediately before making the urea assay.—J. pharm. chim., 22 (1920), 449.

Solution of Iodoform.—This may be prepared as follows: 70 grammes of potassium hydroxide are dissolved in 50 mils of water and the solution is mixed with 100 grammes of oleic acid and 70 grammes of alcohol. Then 60 grammes of finely powdered iodine are added in small portions. The light brown liquid, thus obtained, is decolorized by the addition of a few drops of caustic potash solution and allowed to stand protected from light for several days. The light yellow liquid, which is miscible with water, ether, chloroform and fixed oils, is decanted. —Bull. Scienc. Pharmacol., through Pharm. Weekbl. 57 (1920), 666. (H. E.)

Solution of Iron Albuminate.—Kazay suggests the following for preparing solution of iron albuminate: Pour clear egg albumen solution in a thin stream into dilute liquor ferri oxychlorati (Merck) while stirring slowly. The ferric albuminate

precipitates as a flocculent mass. The water used in washing or diluting must be free from air, and CO_2 which would affect the stability of the colloidal solution.—Pharm. Monatsh., through Schweiz. Apoth. Ztg., 58 (1920), 399. (H. A. L.)

Solution of Magnesium Citrate.—*Analysis of.*—Joseph L. Mayer gives a detailed method for assaying this preparation. It calls for simpler apparatus than that of the U. S. P., is more quickly carried out and is claimed to be equally accurate.—J. Am. Pharm. Assoc., 9 (1920), 253. (Z. M. C.)

Physiological Salt Solution.—*Is it of Value?*—W. Straub criticises the official physiological salt solution, which he considers worse than useless for the purposes to which it is put. Ringer's solution consisting of sodium chloride, potassium chloride, calcium chloride, magnesium chloride and sodium bicarbonate, more nearly approaches the composition of blood serum but has the disadvantages coming from the presence of the calcium salts; their tendency to precipitate. Straub claims to have solved the problem of preparing an artificial serum in his proprietary preparation, *normosal,* (See page 173).—Münch Med. Wsch., through Pharm. Ztg., 65 (1920), 188.

Quin-Formalin Germicidal Solution.—J. T. Pilcher recommends the following as a useful germicidal solution in surgical practice:

Quinine sulphate	1	Gm.
Hydrochloric acid	0.5	mil
Glacial acetic acid	5	mils
Sodium chloride	17.5	Gm.
Formaldehyde (40 percent.)	1	mil
Thymol	0.25	Gm.
Alcohol (95 per cent.)	15	mils
Water, to make	1,000	mils

Dissolve the quinine in the acids and the salt in the water, and mix these solutions. Add the formaldehyde and finally the thymol dissolved in the alcohol.—Ann. Surgery, through Am. Drug., 68 (May, 1920), 18.

Sodium Hypochlorite Solution.—*Stabilized.*—Inasmuch as the bulkiness and lack of stability of neutral sodium hypochlorite

solutions constitute the chief objections, George E. Ewe reports upon a formula which is fairly stable and about ten times as strong. Following is the formula:

Chlorinated Lime (32.5% available Cl)	100 Gm.
Water	127 mils
Sodium carbonate, monohydrated	40 Gm.
Sodium bicarbonate	41 Gm.
Water	379 mils
Calcium chloride (com'l) about	10 Gm.
Dry Slaked Lime, about	5 Gm.
Yield about	240 mils

Manufacturing Instructions.—Place the chlorinated lime in a jar with 127 mils of water, agitate well and let stand tightly covered for 6 to 12 hours. Dissolve the sodium carbonate and sodium bicarbonate in 379 mils water and pour into the chlorinated lime mixture with constant stirring. Stir until the gelatinous mass which first forms is broken up and changes to a powdery precipitate. Let settle. Syphon off and strain roughly into dark glass bottles. Add the calcium chloride to the strained solution and stir for 10 minutes. Then immediately add the dry slaked lime and stir until a filtered portion yields a copious precipitate when the breath is blown through it by means of a glass tube. Filter into dark glass bottles, keeping tightly stoppered in a cool dark place.—J. Am. Pharm. Assoc., 9 (1920), 46. (Z. M. C.)

Liquor Sodæ Chlorinatæ.—*U. S. P. 1840-1920.*—H. A. Langenhan and F. W. Irish trace the development of this preparation, considering every phase of the subject from nomenclature to method of assay.—J. Am. Pharm. Assoc., 9 (1920), 497. (Z. M. C.)

Dakin Products.—*Pharmaceutical Problems Presented by.*—Frank B. Kirby emphasizes the importance of using a "calcium hypochlorite of known and definite free chlorine strength." The original Dakin's solution required titration every 24 hours because a variation of 0.1 per cent could cause failure. The chloramines are more stable than the hypochlorites and their aqueous

solutions when pure keep tolerably but possible organic contamination and sunlight make stock solutions impracticable. Dichloramine-T is oil-soluble but the cost of chlorinated solvent and diluent make chlorcosane the better choice as solvent. It is made by saturating melted paraffin with chlorine. Solutions should be made at time of dispensing with the aid of heat or a few drops of chloroform and dispensed in amber glass stoppered bottles.—J. Am. Pharm. Assoc., 9 (1920), 784. (Z. M. C.)

Dakin's Solution.—*Preparation of.*—Breteau prepares this solution by taking stock solution of chlorinated soda representing 5 grammes of chlorine, adding to it 15 grammes of sodium bicarbonate, followed by enough distilled water to make 1,000 mils.—Rep. Pharm., through Schweiz. Apoth. Ztg., 58 (1920), 437.

Dakin's Solution.—*Preservation of.*—Johannessen filled two 500 mil yellow bottles with freshly prepared Dakin's solution and kept one at room temperature and the other in a refrigerator. In the case of the latter the chlorine loss was only half as much as with the sample kept at room temperature; which lost 0.01 per cent of chlorine per week.—Arch. Pharm. Chem., through Schweiz. Apoth. Ztg., 58 (1920), 437.

Dakin's Solution.—*Experiences in the Manufacture and Standardization of.*—A. J. Sills gives the army method for making this solution and explains that trouble was due to inferior calcium hypochlorite. By analyzing each lot the quantity taken could be adjusted and then by using boric acid sufficient to neutralize, the preparation was satisfactory.—J. Am. Pharm. Assoc., 9 (1920), 881. (Z. M. C.)

Eusol.—*Hypochlorous Acid Content of.*—J. McCrae attempts to correct the confusion concerning the strength of hypochlorous acid solutions produced from bleaching powder. He refers particularly to a paper by E. J. Hart entitled, "A Method for the Accurate Preparation of Eusol." (See YEAR BOOK 1919 p. 89) According to McCrae all of the values given by Hart must be doubled if a solution containing 0.45 per cent of hypochlorous acid is to be obtained.—Pharm. J., 104 (1920), 273. (H. M.)

Vleminckx' Solution.—This solution, used by Dr. W. A. Pusey for verrucæ is a solution of oxysulphuret of calcium. It is in the National Formulary as Liquor Calcis Sulphuratæ and is made by boiling together water, lime and sulphur.—J. Am. Med. Assoc., 74 (1920), 268. (W. A. P.)

Solution of Zinc Chloride.—*Use for Infected Wounds.*—W. W. Babcock has recently reported the successful use of solution of zinc chloride (prepared by saturating U. S. P. hydrochloric acid with zinc) in the treatment of chronic infected wounds of soft tissue and also of bone involvement, and described a treatment in detail.—Am. Drug., 68 (Mch., 1920), 32. (L. N. B.)

LOTIONES

Mouth Wash.—*Recipe for.*—Castile soap, dried and granulated, 6.00 grammes; benzosulphinide, 0.20 gramme; basic fuchsin, 0.002 gramme; oil of cassia, 0.50 mil; oil of peppermint, 0.50 mil; oil of cloves, 1.00 mil; alcohol, 75 mils; water to make 100 mils. A few drops added to water to be used as a mouth wash. It will be noted that, except for the volatile oils present, antiseptics are conspicuous by their absence. It is impossible to disinfect the mouth. Mere bacteriostatic (germ growth inhibitive influence) of antiseptics can be of value only as long as the agent is present; and the time that one is willing to keep the mouth full of fluid is limited. The chief virtue of mouth wash preparations lies in their esthetic qualities, their pleasant appearance, odor and taste, which induces their use.—J. Am. Med. Assoc., 74 (1920), 1732. (W. A. P.)

MAGMÆ

Magma Magnesiæ.—*Improved Recipe for.*—G. E. Ewe has plains in detail the effect of cold and freezing upon the physical characteristics of magnesia magma. He presents micro-drawings illustrating how the magma appears before and after freezing. In concluding his article he mentions several pharmaceutical products which also suffer physical changes due to variations in temperature.—Am. Drug. 68 (Nov., 1920), 25. (H. M.)

Magma Magnesiæ.—*Improved Recipe for.*—Bertha Mueller has succeeded in simplifying not only the technic in the preparation of this popular remedy but also in making a product that compares very favorably with the original proprietary preparation that has been on the market so many years. The formula has always given satisfactory results and is as follows:

Light magnesium oxide, U. S. P.	60.00
Lime water, U. S. P. to make	1000.00

Gradually and with constant stirring add the light magnesium oxide to about 800 mils of lime water contained in a graduate or graduated wide-mouthed jar. Mix thoroughly and bring up to 1,000 mils with lime water, then pour into a bottle of the capacity of about two liters. Stopper the bottle and shake vigorously, at frequent intervals, until the mixture has thickened properly.—Am. J. Pharm., 92 (1920), 162. (J. K. T.)

MISTURÆ

Mixture of Calcium Lactate.—Garry Simpson directs attention to the fact that many of the disappointments experienced with calcium lactate as a hemostatic were due to it not having been freshly prepared, and advises the following method of preparation, which has given gratifying results:

Acid. lactic. 75 per cent. ...	gr. CXL
Aq. dest.	℥iv.
To which add in successive portions:	
Calc. carb. præcip.	gr. lviij.
After effervescence subsides add:	
Tr. capsici	mxij.
Syr. limonis	℥iij.
Aq. chloroformi ad	℥vj.

Each tablespoonful contains 10 gr. of freshly prepared calcium lactate, which is the average dose for a child.—Brit. Med. Jr., through Chem. & Drug., 92 (1920), 748.

Dorsey's Mixture.—This consists of fifteen minims of aromatic sulphuric acid to four fluidounces of a saturated solution of magnesium sulphate.—Am. Drug., 68 (June, 1920), 17.

OLEA

Oleum Dericinatum.—*Manufacture of.*—The oil which combined with menthol and eucalyptol is used for hypodermic injections is prepared according to N. Keulemans by the following process: Castor oil is heated in a fractional distilling flask first at a low temperature to drive off the water and then at about 300° until 10 per cent of the oil has distilled over. The distillate is a mobile, yellow liquid with a peculiar aromatic odor and produces tingling on the tongue. The residue in the flask, which has become strongly acid, is shaken with 50 per cent alcohol, a few drops of phenolphthalein solution and sufficient ammonia water to color the aqueous solution red. The mixture is then allowed to stand over night, the aqueous layer is separated and the oil is heated in order to expel the alcohol. The product thus obtained has the consistence of castor oil, possesses a yellow color, but is no longer soluble in alcohol. Ten parts of menthol and 20 parts of eucalyptol are dissolved in 50 parts of the oil, the mixture is filled in to ampuls and these are sterilized at 125°. Under the name of *Florizine* a product of an ointment-like consistence is marketed, which is obtained by distilling off one half of the castor oil and treating the residue as just given.—Pharm. Weekly, 57, (1920), 758. (H. E.)

PASTA

Depilatory Paste.—Equal parts of barium sulphide and zinc oxide are mixed with sufficient water to form a thick paste. The directions are as follows: Rub this paste on the lip or chin and leave it on until it causes a slight smarting (one or two minutes); then wash off with water. Apply some soothing ointment. The hair can be rubbed off in a short time—say, ten minutes. The first application is sometimes not sufficient, so that a second or even a third may be necessary. It is better to go slowly than risk wounding the skin by leaving the depilatory on too long the first time.—Brit. Med. J., through Chem. & Drug., 93 (1920), 1364.

Sag Paste.—*Use in Burns.*—A medical ointment used in the treatment of burns, made by a number of large manufacturers

for the Government during the war with Germany under the name of "Sag Paste," has the following variant formulas:

Formula No. 66: Zinc oxide, 100 mesh U. S. P., 40 parts; benzoinated lard, 20 parts; refined raw linseed oil, 20 parts; adeps lanæ, U. S. P., 20 parts; coloring matter, 1 part.

Formula No. 146: Zinc oxide, 100 mesh U. S. P., 45 parts; benzoinated lard, 10 parts; refined raw linseed oil, 30 parts; hydrous lanoline (Adeps Lanæ, U. S. P.), 15 parts; coloring matter.

Formula XII-A: Soya bean oil, 62 per cent; zinc stearate, 38 per cent.

During the war "sag paste," put up in collapsible metal tubes, similar to those used for tooth paste and ointments, was purchased by the Government principally for the treatment of gas burns.—Pharm. Era, 53 (1920), 112.

Zinc Paste.—*Preparation of.*—T. Goldschmidt has patented the following method of preparing a zinc paste. Soften 200 grammes of gelatin in 300 grammes of cold water; then add 100 grammes of zinc oxide and 400 grammes of glycerin; warm on water bath with stirring until a uniform paste is obtained. Instead of the 400 grammes of glycerin, 150 grammes of ethylene glycol may be used.—Pharm. Zent., 61 (1920), 471.

PILULÆ

Pills.—*Disintegration of.*—John Grönberg discusses the following points concerning the disintegration of pills:

(1) The disintegration of pills administered per os and looked for in the feces.

(2) The time that must elapse between the taking of iodides and the appearance of iodine in the urine.

(3) The comparison of pills made by the author with similar pills on the market.

(4) the influence of age.

(5) the exactitude of dosage in pills made in pharmacies.

The author further outlines, in detail, his various examinations and experiments.—Pharm. J., 104 (1920), 197. (L. N. B.)

Arsenic Pills.—*Action of Moulds on.*—It is reported that in a batch of pills containing arsenous acid, extract of licorice

root, powdered licorice root and mucilage of acacia, a strong odor of garlic was noticed after keeping for a week. The odor was not due to arsine but to diethylarsine. A mould present was identified as *Aspergillus glaucus*. The formation of moulds can be inhibited by previously drying the pills.—Pharm. Ztg., through Drug. Circ., 64 (1920), 102.

"Pil. Champney."—Langford Moore states the recipe for this pill is:

℞ Hyd. Perchlor. ..... $\frac{1}{32}$ gr.
Ext. Aloes,
Ext. Nuc. Vom. Sicc.,
Ext. Belladonna, Sicc., ...aa ¼ gr.
Fiat. pilula. Ter in die ante cibos.

—Phar. J., 104 (1920), 39.

SAPONES

Soaps.—*"Antiseptic" and "Germicidal."*—John F. Norton, working under a grant from the Therapeutic Research Committee of the A. M. A. Council on Pharmacy and Chemistry reports an extensive bacteriologic study undertaken to check the claims made for the so-called antiseptic and germicidal soaps which are on the market. His conclusions are: Sterile hands are not obtained in the ordinary process of hand washing. More bacteria were found to be removed by the ordinary toilet soaps than by the special soaps. In other words, the cleansing properties of a soap are more important than its "germicidal" or "antiseptic" constituents. The soap solutions obtained in hand washing are of no practical germicidal or antiseptic value. The soap left on the hands after washing has no germicidal action. In the whole process of hand washing, done in the usual manner, the special so-called "germicidal" or "antiseptic" soaps exhibit none of these properties. Therefore, these terms are not proper to use in connection with soaps. Finally, since the hands may serve as a medium for the conveyance of bacteria in infectious diseases, it is important to remove these bacteria and this may be done by the ordinary toilet soaps as effectively, if not more

so, as by the special brands of the so-called "antiseptic" or "germicidal" soaps.—J. Am. Med. Assoc., 75 (1920), 302. (W. A. P.)

Soaps.—*Assay of Resins in.*—Fortini found that when applying Twitchell's method for estimating resins in soaps, inaccurate results are obtained, because in pure soaps resins are liable to be found by this method and furthermore because the method is adaptable only to rosin and not to other resins. He, therefore, gives a method based on the insolubility of nitrated resins in petroleum ether. Two grammes of the mixture of fatty and resin acids are dissolved in a separatory funnel in 20 mils of petroleum ether (in the presence of resin acids no perfectly clear solution is obtained), 10 mils of a mixture of 25 per cent fuming nitric acid (sp. gr. 1.52) and 75 per cent of nitric acid (sp. gr. 1.42) is added, followed by a few crystals of urea and the mixture is shaken for 2 to 3 minutes. The acid liquid is then drawn off, the petroleum ether and precipitate are shaken with 50 mils of nitric acid, which is again drawn off, and are then washed with water. The clear ethereal solution is then evaporated to dryness, and the residue, consisting of fatty acids, is dried to constant weight. The difference between this amount and the amount of mixture of acids taken, is the amount of resin acids.—Seifensieder Ztg., through Pharm. Weekbl., 57 (1920), 487. (H. E.)

Soap.—*What is White Castile.*—T. R. Lockwood says that it has been suggested that the official Sapo be a milled soap made by a settled or grained process, and that this would seem to be an attempt to exclude foreign-made pure Castile soap. Such limitations are obviously unscientific, unnecessary and unfair. He further says that white Castile soap is a drug and as such has definite, important and recognized properties, and virtues. A better description for an ideal, white Castile soap would be "a soap made from pure olive oil and sodium hydroxide, carefully and perfectly saponified, resulting in a pure white soap of hard, compact grain, without free or unsaponified oil and without free alkali. Its odor is sweet and characteristically pleasant." —Drug. Cir., 64 (1920), 91. (L. N. B.)

E. V. Kyser gives some reasons why the Revision Committee should adopt the standards for soap which the U. S. Bureau of Standards provides. He describes briefly the cold, "semi-boiled" and "boiled" process of manufacture and shows why the boiled gives the best product. The process of milling is explained also. The three methods of obtaining fats, rendering, expressing and extraction, with details of the production of olive oil are given and finally a summary of the objections to Castile soap.—J. Am. Pharm. Assoc., 9 (1920), 1079. (Z. M. C.)

Soaps.—*Harem.*—In the harems of Turkey a fine soap is used for toilet purposes, a soap that is made at Teropoli, near Jerusalem. It comes in small cakes shaped like fancy biscuits, each stamped with an ornamental design.

This soap contains no animal grease, but is made from oil. It is pale greenish gray in color and usually unscented, though some of the cakes are faintly perfumed with oil of cedar.

Cleanliness is a part of the religion of all Mohammedans, who must wash at least three times a day, consequently soap is an important object among them. At Teropoli some of the makers are running small factories that have been in operation for several hundred years, and the older of them ornament their product with a legend in Arabic that gives the name of the firm and the date of its foundation.—Toilet Requisites, through Merck's Rep., 29 (1920), 137.

Soap.—*Manufacture from Milk Residues.*—F. Reisz reports that soap can be made from milk residues obtained in the butyrometrical estimation of butter-fat in milk. The liquids which contain sulphuric acid, amyl alcohol and butter-fat are collected, the butter-fat is then skimmed off, melted by warming and shaken in a separator with water until the acid is removed. It is then filtered while still hot. The fat, which has a melting point 38° and a Koettsdorfer number 220.4, can be utilized for making soap. The latter, however, always exhibits an odor of amyl alcohol.—Milchwirtsch. Zentralbl., through Pharm. Weekblad., 57 (1920), 406. (H. E.)

Soap.—*The Lathering of.*—J. Leimdörfer explains at length the electrolytic conditions, essential to the formation of satisfactory

lather. For details, the reader is referred to the original article. —Seifensieder Ztg., through Pharm. Zent., 61 (1920), 409.

Liquid Soap.—*Antiseptic.*—An antiseptic soap similar to lysoform, can be prepareed from 26 parts of solution of potassium hydroxide (15%), 44 parts of formaldehyde solution (35%), 20 parts of oleic acid, 10 parts of alcohol (90%) and 0.1 part of lavender oil.—Chem. Umschau, through Pharm. Zent., 61 (1920), 114.

SPIRITUS

Bay Rum and Toilet Waters.—G. M. Beringer deprecates the use of tartar emetic as a denaturing substance and points out that experts are agreed as to the danger of poisoning either through accidental or intentional consumption of bay rum and toilet waters containing this chemical. It is also pointed out the constant local application of these preparations to the hair and skin would be harmful. A list of substances is given as denaturants that could be used without harm resulting.—Am. J. Pharm., 92 (1920), 17. (J. K. T.)

Spirit of Camphor.—*Assay of.*—L. Lautenschläger assays spirit of camphor as follows: To 10 mils of the spirit add 50 mils of normal alcoholic hydrazine solution and boil the mixture (with upright condenser) on a water bath, for five hours. Evaporate the alcohol from the fluid, add water, filter and dilute the filtrate with water to 100 mils. To 10 mils of the filtrate, add 50 mils of tenth-normal iodine and a little sodium hydroxide solution and then titrate with tenth-normal thiosulphate. After acidulation with diluted sulphuric acid. Not more than 13.1 mils of the thiosulphate solution (representing 9.9% camphor) should be required.—Arch. Pharm., through Pharm. Zent., 61 (1920), 132.

Spirit of Camphor.—*Practical Testing of.*—A. B. Lyons directs attention to some of the difficulties in determining camphor in alcoholic solution if it is not dextrogyrate or if a polariscope is not at hand. Precipitation by saline solution and subsequent solution in an immiscible solvent requires a Babcock milk testing outfit and scrupulous adherence to detail. The method, of some

pharmacopœias, which depends on incipient precipitation by distilled water also has conditions that require careful regulation and the alcoholic strength must be determined first. Mr. Lyons suggests that the latter process might be reversed and the alcoholic strength determined in the usual manner after precipitation of camphor by a solution of sodium chloride.

If an alcohol below 95 percent. is used in preparing a spirit of camphor, the amount of water which will cause turbidity can only be determined by experiment and results indicate that an empirical table would not be feasible to obtain exact quantitative figures.

Mr. Lyons believes that adding the diluted spirit to a fixed quantity of water offers a method that will give more uniform results because the small amount of alcohol would mean slight increase in temperature and because the proportion of dissolved camphor would vary little owing to the nearly uniform alcoholic strength of the solvent. Details of procedure are given, as well as a table of specific gravities and correcting for determination of approximate alcoholic strength.

In conclusion Mr. Lyons retracts his former statement that "the simplest and perhaps the best way of testing spirit of camphor is by determining its specific gravity," giving the reasons why that method is not satisfactory.—J. Am. Pharm. Assoc., 9 (1920), 1163. (Z. M. C.)

Whisky.—*Barred from the United States Navy.*—An order has been made public declaring that liquor will no longer be used even for medicinal purposes in the navy. As soon as the present supply is exhausted, this article will be stricken from the lists of the medical supply depots.—Bull. Pharm., 34 (1920), 411. (C. M. S.)

SUCCI

Lime Juice.—*West Indian Production.*—The island of Montserrat produced approximately 142,277 gals. of lime juice during the 1918-1919 year, compared with an annual average of 147,587 gals. for the previous five years, and 222,025 gals. for the period of 1909 to 1912 inclusive.—Chem. & Drug., 92 (1920), 716 (K. S. B.)

Orange and Lemon Juice.—*Preservation of.*—Experiments on the drying and preservation of orange, lime and apple juices tend to show that a residue can be obtained by evaporation which still possesses a considerable fraction of the anti-scorbutic potency of the original juice. In these experiments the lime juice and apple juice were evaporated on a commercial scale. The orange juice was completely dried in the laboratory, and after preservation for ten years in the dry condition was still highly potent. In regard to lemon juice, it was shown that by the addition of an excess of calcium carbonate, and afterwards of absolute alcohol, the citric and other organic acids can be removed, and a neutral solution from which the alcohol is removed *in vacuo,* containing little solids, but the entire anti-scorbutic content of the lemon juice can be thus obtained. This solution can be concentrated, and even brought down to dryness, under certain conditions without losing its potency. Such concentrated anti-scorbutic solutions have been tested on monkeys suffering with acute scurvy, and on scorbutic infants, with success.—Lancet, through Pharm. Era, 53 (1920), 50.

Rhubarb Juice.—*Composition of.*—Analysis of four samples of rhubarb (stalk) juice are recorded:—Sp. gr., 1.0187—1.0237; total solids, 3.69—4.96; total sugar (as invert sugar), 1.21—2.08; ash, 0.62—0.77; oxalic acid, 0.23—0.32; citric acid, 0.08—0.24; malic acid, 2.0 per cent.; free acidity (mils of $N/1$ acid), 26.5—29.6. Free oxalic acid is not present in the juice. The free acidity decreases when the juice is fermented, and the whole of the combined oxalic acid may be removed by suitable treatment with calcium carbonate.—Z. Unters. Nahr. Genussm., through J. Soc. Chem. Ind., 39 (1920), 556A.

Vegetable Juices.—*Bactericidal Activity of.*—C. Sarti made experiments with the juices of onions and of garlic bulbs, and with the fruit juices of the lemon, orange, and mandarin orange. The bactericidal power was determined by immersing silk threads contaminated with certain pathogenic organisms in these juices under similar conditions, and then instituting cultivation tests. All the juices possess a certain bactericidal power. Garlic and lemon were the most active; the bactericidal power of

orange and of onion juice was less marked; mandarin orange was the least active juice. The onion and garlic juice evidently owe their bactericidal properties to the sulphurated volatile oils they contain. When these were removed by shaking out with ether, the residual juices had no germicidal action. In the same way the activity of the fruit juices seems to depend mainly on the amount of free acid present. When this is neutralized the juices cease to exert any bactericidal power.—Am. Igien, through Pharm. J., 104 (1920), 171.

SUPPOSITORIA

Extemporaneous Suppositories.—J. U. Lloyd directs attention to the fact that in 1865, Dr. Wm. B. Chapman devised a suppository mold to supercede the paper cones then in use. It was the practice to breath into the chilled mold just before pouring in the melted mass. The minute drops of water which condensed on the mold prevented sticking. Dr. Lloyd exhibited the Chapman suppository mold and some specimen suppositories.—J. Am. Pharm. Assoc., 9 (1920), 595. (Z. M. C.)

SYRUPI

Syrup of Belladonna.—*Toxic Effect on a Child.*—H. Bourges prescribed 15 grammes of syrup of belladonna of the French Codex in a 120 mil mixture which was taken during 48 hours by a girl of 14 years. All of the symptoms of belladonna poisoning became evident but the patient recovered.—J. Pharm. Chem., 21 (1920), 295.

Syrup of Five Roots.—This ancient preparation, according to L. Buttin, was described in the Dispensatorium of Valerius Cordus of 1553, under the name of *Syrupus de Quinque Radicibus,* and has since then been largely used both in Germany and France. The recipe called for 4 ounces of each of the five roots, parsley, fennel, celery, asparagus and *Ruscus aculeatus,* doubly infused with boiling water, the infusion being concentrated to the amount necessary to make a saturated solution with 4 pounds of sugar.—Schweiz. Apoth. Ztg., 53 (1920), 510.

Syrup of Iodotannin.—A. L. Malmanche proposes the following method of procedure in its manufacture, claiming the reduction of the sugar, by the hydriodic acid, as results in the official process (French), is entirely obviated. The method is as follows: 20 grammes of iodine and 70 grammes of sugar are intimately mixed and powdered and are added to 40 grammes of tannin, together with about 700 grammes of water, all contained in a liter flask. The flask is stoppered with a firm pledget of cotton and very carefully heated over a Bunsen burner, taking great care that a temperature of 60° is not exceeded. The mixture is agitated from time to time and after the combination of the iodine with the tannin is effected, is allowed to cool and then set aside for at least 24 hours. Filtration is then resorted to and the filter washed with several portions of distilled water, after which syrup is added to make the whole weigh 10 kilogrammes. The author suggests, in view of the fact that the tannin is never quite pure, that for each kilogramme of the syrup to be prepared, 0.1 gramme of tannin be used in addition to above quantity.—Rept. Pharm., 6 (1920), 161.

Syrup of Neosalvarsan.—Dr. W. Patzschke uses a syrup made from 0.3 gramme of neosalvarsan and 30 grammes of simple syrup as a wash for syphilitic ulcers in the mouth and even as a dressing on syphilitic eruptions.—Dtsch. Med. Wsch., through Pharm. Ztg., 65 (1920), 151.

Syrup of Red Poppy.—*Manufacture from the Dried Petals.*—The Dutch Pharmacopœia directs that the syrup be made from the fresh petals. D. H. Wester, however, reports that a syrup made from the dried petals is just as satisfactory as the official preparation.—Pharm. Weekbl., 57 (1920), 661. (H. E.)

Syrup of Thyme.—The following formula yields a product very similar to the proprietary, *Pertussin,* in taste, flavor, composition, and probably in activity as well: Fluidextract of thyme, 15 mils; glycerin, 15 mils; syrup, to make 100 mils. To make the fluidextract of thyme, thyme in No. 60 powder is moistened with a mixture of water 25 mils; alcohol, 15 mils and glycerin, 10 mils. After standing five hours the mixture is packed into a

percolator and exhausted with a mixture of alcohol, 1 volume, and water, 3 volumes. The first 85 mils of percolate are reserved, the weak percolate is concentrated to a soft extract, dissolved in the first percolate and a mixture of alcohol, 1 volume, and water, 3 volumes is added to make up to 100 mils.—J. Am. Med. Assoc., 74 (1920), 905. (W. A. P.)

TABLETTÆ

Compressed Tablets.—*Limitations of.*—Utz reviews the criticisms which have been voiced from time to time against tablet medication. He classifies the complaints as follows and gives suggestions as to how the shortcomings complained of may be overcome in the technic of manufacture: Variation in weight of tablets in the same lot; variation in content of active ingredients; discoloration; excessive hardness and insolubility which prevents distintegration in the alimentary canal; improper granulation which causes tablets to crumble; presence in too large amounts of inert substances used as fillers. In his experience the best fillers are sugar of milk and starch and in his opinion tablet manufacturing can not be learned from books but it is an intricate subject with constantly varying details which can only be mastered as a result of practical experience.—Pharm. Zent., 61 (1920), 349. (R. P. F.)

Dispensing Tablets.—*The Accuracy of.*—Jos. W. E. Harrisson and K. F. Ehman examined a number of tablets of strychnine sulphate and mercuric chloride in order to determine whether it was safe to use them in compounding prescriptions. They found that in general the tablets are near the stated weight. The more than 15 per cent deficiency found in one lot was believed to be due to disintegration in transportation rather than to faulty manufacture. Ten per cent. would be negligible in the dosage of either of these chemicals.—J. Am. Pharm. Assoc., 9 (1920), 518. (Z. M. C.)

Disintegrating Tablets.—These can be made by adding to the tablet mass, prior to compression, 10 to 20 per cent. of magnesium peroxide.—Pharm. Post., through D. A. Apoth. Ztg., 40 (1920), 144.

Poison Tablets.—*Coating for.*—Philips has developed a coating intended to render poison tablets innocuous when swallowed, but which interferes in no way with their use for making germicidal solutions. The contrivance consists of a coating of wax, the wax having a melting point above the highest climatic temperature, one which is not brittle and therefore which will not crack or scale from the tablet in handling; and, above all, which not only as insoluble in water, but is not affected by the digestive juices. Tablets coated with such a wax pass through the alimentary tract unchanged and consequently prevent any solution or absorption of the tablet substance while in the body. By breaking the tablets they may be dissolved readily when it is desired to prepare solutions from them. After many trials during which a large variety of substances had been rejected as unsuitable for this purpose, a coating has been developed which not only satisfies all theoretical requirements, but which meets every demand for practicability. By mixing equal parts by weight of candelilla wax and a paraffin having a melting point of 56°, a wax is obtained which melts at 70°, which has a low coefficient of expansion and, therefore, little brittleness, which is unaffected by dilute acids and alkalies and which is not attacked by digestive ferments. Furthermore, the device presents no serious difficulties as to manufacture. The machines employed for coating pills with gelatin are equally well adapted to applying the wax coating to tablets; while the combined cost of the materials and the process for quantity production is negligible. The perfected coating has the added advantages of protecting the tablet from moisture and from breaking or crumbling in the container. Deterioration is prevented, and exact dosage is assured.—J. Am. Med. Assoc., through Am. Drug., 68 (Nov., 1920), 58.

Tablets.—*Manufacture of.*—"Successful tablet making requires a full pharmaceutical training and in addition, requires all the mechanical genius of a mill wright, a master mechanic, an engineer, an electrician, the perseverance of Napoleon, the patience of Job, and the power of leadership," writes Robert C. White, who takes up tablet manufacture from all points of view. Mr. White shows the wide field covered by pointing out that

the pharmaceutical chemist not only must know the solubility, the color reaction, the keeping qualities of his tablets, but he must ever consider the needs of the physician, whether the tablet disintegrates slowly, if it is absorbed in the stomach or the intestinal tract, and he must also keep in mind if it is possible to make use of all of his mechanical devices. In general, tablets are formed by pressure on the ingredients between two punches restricted in expansion by the surrounding die; standard punches and corresponding dies run in sizes from one-thirty-second ($\frac{1}{32}$) to one inch in diameter; punches and dies, however, can be made so as to give any shape desired to the tablet. If not coated, the tablets are usually made of known concavity; a deeper cup is used for coating, thus giving a more spherical outline to the tablet—a great aid to uniform coating. The paper discusses in detail degree of granulation, excipients, drying apparatus and compressing machines and diluents. He states that potato starch added dry to the granules before they are placed in the hopper for compression is the best disintegrating agent; this swells rapidly thus, a tablet containing this starch ruptures as soon as dropped into water.—J. Am. Pharm. Assoc., 9 (1920), 788. (M. O'C. D.)

Tablets of Mercuric-Potassium Iodide.—*Examination of.*—A. J. Jones discusses the quality of these tablets as found in the British market. Assays of eight samples showed presence of the quantity of $HgI_2 2KI$, in each tablet as follows: 1.0424, 0.6821, 0.6204, 0.5670, 0.5638, 0.5281, 0.5269 and 0.2698 grammes, respectively. In his work, he found the Rupp formaldehyde reduction assay of mercury and the Andrews iodate assay of iodine, the most satisfactory methods to use in examining the tablets.—Chem. & Drug., 92 (1920), 523.

Saccharin-Sodium Bicarbonate Tablets.—*Change in.*—O. Beyer found that saccharin-sodium bicarbonate tablets (1+4) quite rapidly change and that most of the saccharin (about 95 per cent) combines with the sodium with the formation of soluble saccharin within a very short time. The change takes place during the granulating and compressing processes.—Chem. Zeit., through Pharm. Weekbl., 57 (1920), 333. (H. E.)

TINCTURÆ

Tinctures.—*Alcoholic Content of.*—Because of the high price of ethyl alcohol, Runge and Groebing studied the possibility of decreasing the alcohol content of certain tinctures, such as cinchona, nux vomica and valerian. They found that at least in the case of tinctures of cinchona and nux vomica, the alkaloidal content was highest when the quantity of alcohol as directed by the D. A. V. was employed. Increased quantities of water, as might have been expected gave a higher ash content and in general a deeper color. The result of the investigation showed that the alcohol content could not be lessened without materially reducing the value of the preparation.—Apoth. Ztg., through Pharm. Ztg., 65 (1920), 263.

Tincture of Colchicum.—*Identification of Colchicine in.*—Considering colchicine as an anthracene derivative, C. Glucksmann applied to tincture of colchicum or to evaporated residues therefrom or to extracts shaken out with immiscible solvents, the appropriate anthracene tests. Of these he found most satisfactory (a) the yellow color produced with concentrated hydrochloric acid; (b) the green color produced with ferric chloride and concentrated hydrochloric acid. Details of manipulation are given in the article.—Tschecho-Slovak. Apoth. Ztg., through Pharm. Ztg., 65 (1920), 886.

Tincture of Ginger.—J. F. Geisler, discussing the action of the Federal Prohibition Commissioner in ordering that no tincture of ginger can be sold unless double the U. S. P. strength, points out that this action may be due to the loose U. S. P. requirement that the dry residue from tincture of ginger "does not exceed 2 per cent." The "does not exceed 2 per cent." is either a misprint or an unfortunate wording as to the intent to indicate the amount of extractive as a minimum of 2 per cent. A tincture containing not less than 2 per cent. has a minimum fixed per cent. of extractive, whereas "does not exceed 2 per cent." may mean anything from a colored alcohol solution with a suggestion of ginger to the limit of 2 per cent. This phrase has undoubtedly been taken advantage of by unscrupulous

manufacturers, and it is quite certain that the committee suggesting the doubling of the strength (in amount of extractives) of the U. S. P. tincture of ginger was not aware of the ambiguity or exact wording of the percentage requirement of extractives in the U. S. P. tincture of ginger.—Drug. Circ., 64 (1920), 466.

Tincture of Iodine.—*Preparation of.*—Ferraro uses a flask with a hollow glass stopper in which the iodine is placed. The flask is filled with 95 per cent. alcohol so that the iodine is in contact with the surface of the fluid and thus dissolves by circulatory solution. Ferraro adds to the tincture 2 per cent. of iodic acid as a preservative.—Bull. Chim. Farm., through Schweiz. Apoth. Ztg., 58 (1920), 400.

Tincture of Iodine.—*French Codex.*—George Walker states that in Edinburgh, because of the vogue of the Bourdreau iodine treatment, a number of prescriptions are written calling for "tincture iodi. F. Cod." The French preparation contains 1 part of iodine in 9 parts (by weight) of 95 per cent. alcohol and is therefore quite different from the British product, which is made from 90 per cent. alcohol and which contains potassium iodide. The British pharmacist can prepare the French product by the following recipe, *using British measures:*

Iodine in powder	grs. 40
Absolute alcohol	℥iij. m35
Rectified spirit, B.P.	℥iv. m25

The author in his experiments determined the solubility of iodine in alcohol of various strengths. His results follow:

Solubility of Iodine in Alcohols of varying Strengths at 15.5° C.

	Weight in weight	Weight in volume	Grains in minims
Absolute alcohol	1 in 6.00	1 in 7.60	1 in 8.34
Alcohol (95 per cent.)	1 in 6.58	1 in 8.08	1 in 8.90
Alcohol (90 per cent.)	1 in 10.50	1 in 11.59	1 in 13.90

—Chem. & Drug., 93 (1920), 1773.

Compound Tincture of Larkspur.—*Manufacture from a Denatured Alcohol.*—George Decker suggests that, as one of the denatured alcohol formulas called for the mixing of camphor

and oil of rosemary with the alcohol, a tincture of larkspur made with such an alcohol could be furnished to the public at a cost much less than that now obtaining.—D. A. Apoth. Ztg., 41 (1920), 129.

Tincture of Nux Vomica.—*Note on.*—J. K. Thum found 2.5 per cent. of oil in nux vomica and other investigators have found more. The present U. S. P. menstruum cannot give an elegant preparation. Mr. Thum used purified petroleum benzin to remove the oil, then dried the drug to remove odor. Percolation with diluted alcohol yielded a preparation inelegant in appearance and assaying 0.20 per cent. Various strength of alcohol were tried up to the present U. S. P. strength of 3 to 1. The author was able to make a tincture meeting the alkaloidal standard of the Pharmacopœia and of good appearance with a menstruum of 650 parts alcohol and 350 parts water. Neither the oil nor a further extraction of the marc responded to Mayer's reagent.—J. Am. Pharm. Assoc., 9 (1920), 705. (Z. M. C.)

Tincture of Strophanthus.—*Standardization of.*—C. T. Bennett offers a few suggestions for the consideration of a future pharmacopœial revision committee. Some of the questions involved deal with the importance of the drug mixed varieties, supervision in collecting and finally the possibility of replacing the tincture by the glucoside, strophanthin.—Pharm. J., 105 (1920), 83. (F. H.)

Tincture of Vanilla.—*Manufacture of.*—K. A. Bartlett directs attention to the faulty methods of the U. S. P. VIII and N. F. IV for this tincture. Mixing sugar with the cut beans makes a viscid mass. The thin coating of a fixed oil which is applied to the beans before they are put into bundles, combined with the fixed oil naturally present makes the maceration with strong alcohol and subsequent dilution with water (the N. F. method) a serious mistake. Mr. Bartlett submits a method which has been used satisfactorily for some time.

"Vanilla, cut in small pieces..... 100 Gm.
Sugar granular ..... 200 Gm.
Diluted alcohol, a sufficient quantity to make. 1000 mils

Place the cut vanilla beans together with three hundred and twenty mils (320 mils) of diluted alcohol into a 1000 mil flask, preferably one with a wide mouth, and heat on a water bath under a reflux condenser for 6 hours, keeping the mixture nearly to the boiling point, but not high enough to cause any loss of alcohol. Allow to cool and strain the liquid through a cheesecloth. Then place the cut vanilla beans in a percolator, preparing the percolator as follows:—In the bottom place a piece of filter paper large enough to cover the bottom and extend a short way up the sides of the percolator. Then put in a layer of clean white sand, on top of that a layer of kieselguhr and then another layer of sand. Pack alternately a layer of vanilla beans and a layer of kieselguhr. Pour on the strained liquid and percolate slowly, continuing percolation with diluted alcohol. Mix the sugar with the percolate as fast as it is received and dissolve by agitation. Continue percolation to obtain 1000 mils." —J. Am. Pharm. Assoc., 9 (1920), 706. (Z. M. C.)

TROCHISCHI

Gums and Pastilles.—*Manufacture of.*—F. C. C. Robb, describes gums and pastilles as more or less soft jelly like jujubes made from gum, gelatin, agar-agar or isinglass and sweetened, colored and flavored.

In this detailed account of the manufacture, he points out the process of the molding, the pouring of the mass, the finishing off and the crystallization of gums and pastilles.—Pharm. J., 105 (1920), 187. (L. N. B.)

Lime Juice Lozenges.—*Containing Vitamines.*—A method for the preparation of a lemon-juice tablet rich in antiscorbutic vitamine has recently been devised at the Royal Naval Medical School, Greenwich. The lemon-juice is first strained through muslin, then filtered under reduced pressure. The filtered juice is evaporated *in vacuo* over sulphuric acid at 15° C. The residue of non-crystallizable syrup is made into a mass with a mixture of milk-sugar 97 per cent. and gum tragacanth 3 per cent., and cut into tablets, so that each tablet contains the juice of half a lemon.—Chem. & Drug., 92 (1920), 860.

UNGUENTA

Green Mountain Salve.—The following is a formula that has been used considerably, but may be varied for different climates; Beeswax, 4 ounces; rosin, 5 pounds; Burgundy pitch, 4 ounces; balsam of fir, 1 ounce; Venice turpentine, 1 ounce; verdigris, 1 ounce; tallow, 4 ounces; oil of origanum, 1 ounce; oil of hemlock, 1 ounce; oil of red cedar, 1 ounce; oil of wormwood, ½ ounce. Melt the first three ingredients, add the tallow and turpentine. Rub the verdigris up with a little of the oil, then add the whole and stir well. Now pour the mixture into cold water and knead as you would dough. Roll into sticks.—Apothecary, through Pharm. Era, 53 (1920), 112.

Iodine Ointment.—*Bases for.*—George E. Ewe reports comparative loss of free iodine in this ointment prepared with more than ten different bases. Yellow petrolatum, anhydrous eucerin, coconut oil and hydrogenated vegetable oil show the smallest loss of free iodine. The tendency of coconut oil to crystallize and its low melting point are objections but yellow beeswax would remedy these points. The one objection to anhydrous eucerin is the high cost. Hydrogenated vegetable oil is less efficient than the other three but otherwise it makes a good ointment. A three per cent ribbon tragacanth paste keeps as well as lard and is more effective.—J. Am. Pharm. Assoc., 9 (1920), 49. (Z. M. C.)

Mercurial Ointment.—*Analysis of.*—J. L. Mayer extracts the fat with 50 mils of gasoline decanting and filtering to separate. 10 mils of nitric acid are added to the mercury through the paper, then followed by water. Heat is applied until red fumes are no longer evolved. The contents are transferred to an Erlenmeyer flask, diluted with 150 mils of water, 2 mils of ferric ammonium sulphate T. S. and titrated with tenth-normal thiocyanate. Each mil of which corresponds to 0.01003 gramme of mercury.—J. Am. Pharm. Assoc., 9 (1920), 706. (Z. M. C.)

Mercurial Ointment.—*Rapid Preparation of.*—G. Fontès finds that mercury can be rapidly extinguished by trituration in a

mortar with lard containing cholesterol. He reports that 10 minutes trituration produces the mercurial ointments tabulated below.

Lard	Base Cholesterol	Water	Mercury extinguished
100 gm.	2.5 gm.	0 gm.	490 gm.
100 gm.	2.5 gm.	20 gm.	575 gm.
100 gm.	2.5 gm.	50 gm.	970 gm.
100 gm.	5.0 gm.	0 gm.	1500 gm.
100 gm.	5.0 gm.	100 gm.	1900 gm.
100 gm.	5.0 gm.	160 gm.	3000 gm.

A strong mercurial ointment thus prepared can be diluted to the required strength by simple trituration with the diluent.—J. pharm. chim., 21 (1920), 193.

Mustard Oil Ointment.—*A Practical Substitute for.*—G. E. Ewe suggests an aqueous vehicle for the mustard oil applications which physicians sometimes find so efficacious in certain conditions. Briefly, this vehicle is made by soaking three parts of ribbon tragacanth in ninety-seven parts of water. The finished paste is then pressed through a piece of cheese cloth, whcih helps to make it of more uniform consistence. The mustard oil is then mixed with this vehicle by whipping it in with an egg beater (preferably of the covered type to prevent loss of oil and to protect the operator). A two per cent. mustard oil ointment made with this base was found equal in irritation efficiency to a three per cent. mustard oil ointment made with a base consisting of paraffin and yellow petrolatum.—Am. J. Pharm., 92 (1920), 234. (J. K. T.)

Phenol Ointment.—*Effect of Cold on.*—J. Rutherford Hill emphasizes the need for keeping a carbolic ointment of any strength from extreme cold. Although the solubility of phenol in paraffin bases is about 1 in 32 and in this dilution will, in ordinary temperatures, be free from crystallizaton, conditions are of a different nature in temperatures falling below normal.—Pharm. J., 104 (1920), 9. (F. H.)

Phenol and Salicylic Acid Ointments.—*Assay of.*—A modification of the Wilkie method for the determinaton of phenol and

salicylic acid in ointments, meets some special requirements for that work.

The revised method by G. D. Elsdon, is given with the author's criticism of the former method.—Pharm. J., 105 (1920), 86. (F. H.)

Unguentum Heparis Sulfuris.—Krikortz states the following concerning its preparation: 250 grammes of caustic potash are dissolved in 250 grammes of distilled water, and 250 grammes of sublimed sulphur added. The mixture is heated and then filtered. The filtrate is incorporated with 500 grammes each of adeps lanæ and yellow petrolatum. Lastly 250 grammes of liquid petrolatum and 10 grammes of oil of bitter almonds are added.—Farm. Revy., through Pharm. Zent., 61 (1920), 659. (G. C. D.)

Veterinary Blistering Ointments.—*The Standardization of.*—Since these preparations act by contact, the total amount of active ingredient does not act and chemical analysis is not a satisfactory means of standardizing. George Ewe gives details of methods of chemical physical control of their manufacture combined with the physiological tests on finished products.—J. Am. Pharm. Assoc., 9 (1920), 255. (Z. M. C.)

Zinc Ointment.—*Proper Base for.*—Torald Sollmann reports that the revision of the U. S. Pharmacopœia has raised the question as to the most suitable vehicle for a zinc oxide ointment and that, while petrolatum has been extensively substituted for the unsatisfactory official base, fear has been expressed that this base entails a sacrifice of therapeutic efficiency. The chairman of the revision committee having requested information on the subject, Sollmann ascertained the experience of American dermatologists as represented by the American Dermatological Association. From the replies to a questionnaire sent to the members it is concluded: The consensus of the leading dermatologists is distinctly in favor of petrolatum as the basis of zinc oxide ointment as being equal to lard therapeutically and superior in consistency, keeping qualities and absence of irritation.—J. Am. Med. Assoc., 75 (1920), 1420. (W. A. P.)

Zinc Ointment.—*Best Mode of Preparation.*—At a meeting of the Chicago Branch of the American Pharmaceutical Association, A. H. Clark reported on work done on zinc ointment at the request of the Medical Department of the Army. He studied the products of two recipes of the lard type, four of the petrolatum type and six of the wool-fat type. Of these, taking into consideration odor, stability, consistency, smoothness, greasiness and shrinkage, he concludes that the most satisfactory ointment was that made of 65 grammes of white petrolatum, 15 grammes of paraffin and 20 grammes of zinc oxide.—J. Am. Pharm. Assoc., 9 (1920), 1171.

VINI

Wine of Rhubarb.—*Alcohol-free Substitute.*—Macerate 100 grammes of cut rhubarb with 870 grammes of cold water for one-half hour and then boil the mixture for 15 minutes, adding 1 gramme of benzoic acid. After the decoction has cooled, add 2 grammes of saccharin, 20 grammes of Malaga wine essence, 2.5 grammes of spirit of cardamon and 4.5 grammes of spirit of orange. Then add 10 grammes of talcum or other filtering agent and after shaking well, filter.—Z. Oesterr. Apoth. Ver., through Pharm. Zent., 61 (1920), 331.

Fruit-wines.—*Detection in Grape Wines.*—In the Mitteilungen aus dem Gebiete der Lebensmitteluntersuchung and Hygiene veröffentlicht vom schweizerischen Gesundheitsamt the following two methods are given for detecting fruit wines (apple and pear wines) in grape wines. The first one devised by F. Schaffer is carried out as follows: Fifty mils of the wine which should not contain more than 0.5 per cent. of acid (otherwise the acidity is to be reduced by caustic soda solution) are shaken gently two or three times with 200 grammes of magnesium perhydrol and the mixture is filtered. Twenty-five mils of the filtrate are shaken well with 1.5 grammes (in the case of strongly colored wines 2 grammes) of animal charcoal, the mixture is then boiled and filtered. Five mils of the colorless filtrate are neutralized with n/10 sodium hydroxide, using azolithmin paper as indicator, and are then mixed with 2 drops of n/5 silver nitrate and one mil of n/10 caustic soda. The mixture is then

placed in the dark and observed at short intervals, in order to notice within what time a reduction of the precipitate takes place. Fruit wines reduce within a few seconds, while grape wines do not show a brown coloration of the residue even after two hours. Mixtures of both wines reduce within a few minutes to one hour according to the amount of fruit wines present. Up to the present it is not known what substances in fruit wines produce the reduction. So much is certain, that it is not produced by volatile aldehydes, since the reduction takes place with fruit wines even when they have been distilled.

The second method is devised by P. Balavoine and is based on the difference in alkalinity of the soluble and insoluble constituents of the ash of the wines. In grape wines the alkalinity of the insoluble constituents is greater than that of the soluble. In fruit wines the opposite is the case. In other words, the ratio of alkalinity of the soluble ash to that of the insoluble ash in grape-wines is smaller than 1, generally below 0.5. In fruit wines the ratio is greater than 1, generally more than 5. By estimating this ratio it is claimed that an adulteration of grape-wines with 20 or even 10 per cent of fruit wines can be detected. —Pharm. Weekbl., 57 (1920), 668. (H. E.)

Wine.—*Value in Neurasthenia.*—The war has probably cured many neurasthenics, but it has undoubtedly created very many more cases than it has cured. On the other hand, it has re-established the value of the moderate use of alcohol, and especially of wine, in the treatment of neurasthenias produced by prolonged exposure to hardship and nervous stress. Wine has proved invaluable in relieving the bodily and mental discomfort and exhaustion which characterize this form of neurasthenia, known among French troops as "cafard." In the majority of cases neurasthenics are also dyspeptics. In such cases, a modicum of wine, taken with the food, has proved to be of incontestable value. The stimulant action of the small quantity of freely diluted alcohol is doubtless the most important factor. In those cases where the digestion is so deranged that a small amount of acid, of tannin, or of salts in the wine may be considered harmful, good results will be obtained by prescribing a teaspoonful of brandy, or of rum, diluted with a tumblerful of

water, to be taken with the food. The alcohol, thus taken, acts as a lubricant on the bearings of the human machine. It is considered that total abstinence from the use of alcohol is frequently the cause of neurasthenia, especially among women. It is certain that, used rationally, wine is much more than a valuable drug, it is a great prophylactic.—Bull. Gen. Therap., through Pharm. J., 104 (1920), 28.

D—NEW REMEDIES AND TRADE-NAMED PREPARATIONS

NOTE.—The paragraphs in this chapter having journal references in parentheses are taken from the Report of the Committee on New Remedies published in the Proceedings of the New York State Pharmaceutical Association, 1920 and 1921.

Acriflavine, hereafter shortly called "Flavine," in a 1:1000 solution, has been found generally suitable, and may be recommended for most purposes, though a 1:500 solution may be safely used. (It may be noted here that a concentration of 1:100,000 in vitro suffices to kill organisms suspended in serum.) The solvent used is normal saline (0.85 per cent. NaCl.) or water, solution being greatly facilitated by heating (Flavine solutions may be boiled or heated to 130° C. in the autoclave without being decomposed); after cooling the solution should be filtered. It has no corrosive action, and does not cause pain when applied to the injured tissues. It is compatible with 5 per cent. sodium chloride solution, or with 0.5 per cent. sodium citrate.—(Pract. Dr.)

Acyline is a trade name for acetylsalicylic acid.—(Pharm. Zent.)

Adrenaton is an epinephrin preparation.—(Pharm. Ztg.)

Aeolan is a germ-free and toxin-free solution of the proteids of milk. It is used by intramuscular injection in furunculosis, in chancre and other skin troubles.—(Pharm. Zent.)

Aestivalin is a hay-fever remedy said to contain passifloran, calcium lactophosphate, calcium carbonate, bicarbonate and sulphate, and also potassium sulphate.—(Pharm. Zent.)

Agotan is phenyl-cinchoninic acid.—(Pract. Drug.)

Aguttan is the salicylic acid ester of oxychinolin. It is insoluble in water and therefore a tasteless substance; melting point 107°. According to Brugsch, its action is similar to that of atophan, lowering of acidity in urine and also a diminution of pain in gout. It can also be used in other painful rheumatism and neuralgic ailments.—(Drug. Circ.)

Alophen is a proprietary containing phenolphtalein.—(J. Am. Med. Assoc.)

Altannol is the new name for neotannyl, the acetotannate of aluminum.—(Am. Dr.)

Alucol is colloidal aluminum hydroxide, recommended in hyperacidity.—(Pharm. Ztg.)

Aminalit is a water-proof silky aseptic textile for medicinal and pharmaceutical purposes.—(Pharm. Zent.)

Ampsalos is a trade name for ampuls containing neoarsphenamine.—(Pharm. Zent.)

Anaestheticum Parreidt is a two-ampul medication; one containing a solution of novocaine bicarbonate; the other containing a solution of epirenan.—(Pharm. Ztg.)

Aneson is a trade name for tertiary trichlor-butyl alcohol. —(Pharm. Zent.)

Aniodol is an antiseptic described as a stable combination of trimethanal with allyl sulphocyanide in glycerin.—(Pract. Dr.)

Antexema contains 35.4 per cent. of liquid petrolatum, 1.5 per cent. of boric acid and 12.4 per cent. of gum (tragacanth or acacia).—(Pharm. Zent.)

Antiasmatico contains lobelia, digitalis, Indian cannabis, arsenic, quebracho, stramonium and aromatics.—(Pharm. Zent.)

Antibacillare contains lecithin, creosote phosphate, eucalyptol, terpinol, iodine, guaiacol, iodoform and menthol.—(Pharm. Zent.)

Anticancer is an ointment containing radium. (Pharm. Zent.)

Antiplasma according to the chemists of the American Medical Association is a mixture of rosin, oil of turpentine and methyl salicylate.—(J. Am. Med. Assoc.)

Antiseptone, according to the Federal authorities, is a powder composed essentially of anhydrous zinc sulphate, lead acetate and a small amount of copper sulphate.—(J. Am. Med. Assoc.)

Antitosin is sterile bacterial vaccine from the sputum dissolved in the normal saline and intended for injection for colds.—(Pharm. Zent.)

Antoxurin is a vermifuge marketed as chocolate-coated enteric pills, containing in each pill 0.05 Gm. chlorinated benzene.—(Pharm. Zent.)

Anusan Suppositories contain balsam of Peru, resorcinol, iodol and extract of suprarenal glands.—(Ph. Weekbl.)

Apothesine is an efficient local anesthetic belonging to the procaine rather than to the cocaine type, that is, while efficient for injection anesthesia, it is relatively inefficient when applied to mucous membranes. Because of technicalities it is not included in New and Nonofficial remedies but is classed as "described but not accepted."—J. Am. Med Assoc., 74 (1920), 265. (W. A. P.)

Argoflavin is a combination of trypaflavin and silver for intravenous injections in cases of tumors.—(Pharm. Zent.)

Argoplex is a silver polyglycine containing 10 per cent. of silver.—(Pharm. Ztg.)

Argoprotan is a silver proteid containing 10 to 12 per cent. of the colloidal metal.—(Pharm. Ztg.)

Aristochin and Optochin Nitrates.—L. van Itallie and M. Le Coultre have prepared the nitrates of aristochin (diquinine carbonic acid ester) and optochin (ethylhydrocuprein) and have obtained well crystallized salts. The latter combined with two molecules of nitric acid, while the former binds 4 molecules. It is imperative that in the preparation of the salts an excess of nitric acid be present. A. L. W. E. van der Veen gives a detailed crystallographic description of the salts and from his report we find that the nitrates of both products form doubly-refractive rhombic prisms which when viewed through cross-nicols display a beautiful array of colors.—Pharm. Weekbl., 57 (1920), 741, 742.

Arnheim's Cough Drops contain 5 Gm. liquid holopon, 0.15 Gm. extract of belladona, 0.15 Gm. extract of hyoscyamus and cherry laurel water enough to make 30 Gm.—(Pharm. Zent.)

Aroform Tablets contain formaldehyde and aromatics and are recommended in catarrh and influenza.—(Pharm. Zent.)

Arsenferrialbumose is a liquid preparation containing iron and arsenic recommended for anemia and chlorosis.—(Pharm. Ztg.)

Arsen-Glycerosphoscala are glycerophoscala tablets containing 0.005 grammes arsenous acid.—(Pharm. Ztg.)

Arsotonin is a sterile isotonic solution of methyl disodium arsenate in ampuls for subcutaneous injection in anemia and chlorosis.—(Pharm. Ztg.)

Ascamorin Tablets are anthelmintic tablets prepared after the formula of Dr. C. V. Schuler and marketed by Apothecary Storbeck. The tablets contain oil of chenopodium, benzonaphthol, rhubarb, phenolphthalein and oil of peppermint. They are prepared in different strengths for administration to persons of various ages.—(Pharm. Ztg.)

Asygon is a venereal prophylactic consisting of a tube of the Neissler-Seibert salve and a flask containing small urethral bougies containing some disinfectant.—(Pharm. Ztg.)

Asabromine is the dibrombehenic acid salt of calcium. It is a white, odorless and tasteless powder. It is identical in properties and characteristics with sabromine, for which it is suggested as a succedaneum.—(Am. Drug.)

Ascoleine, marketed by F. Moussant and H. Rivier in Paris, is recommended as a substitute for cod liver oil. According to the investigation of Dr. Isaovesco, cod liver oil contains a lipoid which belongs to the group of the lecithines but differs from these in constitution and therapeutic action. This lecithide is obtained by treating cod liver oil successively with acetone and alcohol and subsequently purifying the product by ether; it occurs as an orange yellow, honey like substance which is soluble in ether, alcohol, benzine and chloroform. It melts at 70° and is present in the cod liver oil to an amount of .02 per cent. Ascoleine is a solution of this lecithide in olive oil and is applied both internally and hypodermically.—(Ph. Weekbl.)

Autocalculina Ebrey, according to the Federal authorities, consisted essentially of alcohol, colchicine, ammonium salts, vegetable extractives and water.—(J. Am. Med. Assoc.)

Auto-Hemic Serumis an asserted cure for laziness, ugliness, frigidity and many other things. Auto-Hemic Therapy is described as "The Missing Link in Medicine" and "consists in giving the patient a solution made by attenuating, hemolizing, incubating and potentizing a few drops of his or her own blood and administering it according to a refined technic developed by the author." The "technic" of this new therapy may be learned through a mail order course costing 100 dollars, "cash-in-advance." One of the chief virtues claimed for the serum is that of developing in the patient who takes it an unbounded energy. —J. Am. Med. Assoc., 74 (1920), 477. (W. A. P.)

Baldrisan Tablets contain valerian, bromides, menthol and ethereal oils.—(Pharm. Zent.)

Balifostan is a combination of santalol, bicampho-cinnamate and dioxybenzol.—(Pharm. Zent.)

Bazillosan is a bacterial product recommended in leucorrhea. —(Pharm. Ztg.)

Behrol, I & II, are veterinary preparations recommended for anthrax. The first is said to contain iron, trypaflavin, alcohol, digitalis and nutritive salts.—(Pharm. Ztg.)

Bencinnozat is a combination of sodium benzoate and sodium cinnamate.—(Pharm. Zent.)

Benetol, according to the Federal authorities, consisted essentially of alphanaphthol, soap, glycerin, water, traces of essential oils and alcohol.—(J. Am. Med. Assoc.)

Benzocaine is the name chosen by the Council on Pharmacy and Chemistry for anesthesin.—(J. Am. Med. Assoc.)

Benzylcarbinol or beta-phenyl-ethylol, a constituent of oil of rose, is employed as a local anesthetic, in place of novocaine, being preferable to the latter, because of its more intense action, and its lack of undesired action. It dissolves sparingly in water, about 2 per cent. It has been administered intravenously in form of a 3 per cent. emulsion.—(Schweiz. Med. Wsch.)

Benzyl Succinate has been introduced into medicine as an antispasmodic. It is a powder, that is marketed in 5 grain tablets.

"Big G," according to the Federal authorities, consisted essentially of an aqueous solution of boric acid and berberine.—(J. Am. Med. Assoc.)

Biliol is marketed as enteric pills containing a concentrated extract of the gall of the hog. It is used for gall-stones and in enteritis.—(Pharm. Zent.)

Biosan is a nutritive containing lecithin, protein and nutritive salts.—(Pharm. Zent.)

Bi-Pelotonoids are two-part capsules; one side containing ferrous sulphate, the other, sodium carbonate. They thus furnish freshly prepared ferrous carbonate upon administration.—(Pharm. Ztg.)

Black and White Capsules, according to the Federal authorities, consisted of capsules containing hexamethylenamine and of capsules containing a mixture of volatile oil including cubebs and copaiba.—(J. Am. Med. Assoc.)

Black Caps, according to the Federal authorities, consisted essentially of copaiba, cubebs and saw palmetto.—(J. Am. Med. Assoc.)

Blake's Capsules, according to the Federal authorities, consisted essentially of a tablet of salol suspended in a mixture of volatile oils, oleoresins and plant extractives, including copaiba and cubebs.—(J. Am. Med. Assoc.)

Blau Lution is a fluid containing a boric acid salt of methyl-violet. It is used in veterinary practice as a wound dressing.—(Pharm. Ztg.)

Bluash consists of candies containing extract of juniper berries, recommended as a "blood purifier, nerve strengthener and beautifier."—(Pharm. Ztg.)

Bokosal is a remedy for hemorrhoids.—(Pharm. Ztg.)

Boracetine in 1919 was heralded as "The Guardian of Health." It was claimed to be "an *all-round* antiseptic, especially good for pyorrhea, sore gums, sore throat, etc., excellent for cuts, bruises, insect bites, skin eruptions and, in fact, any condition when an efficient healing agent and germ destroyer is needed." It was also recommended to "get rid of that 'dark brown taste'." Indirectly Boracetine was also claimed to be a preventive of

consumption, scarlet fever, diphtheria, etc. From the analysis made in the A. M. A. Chemical Laboratory it appears that Boracetine is nothing more wonderful than *Liquor Antisepticus, N. F.*, with a dash of formaldehyde.—J. Am. Med. Assoc., 75 (1920), 1920. (W. A. P.)

Boro Tablets or Pastilla Oleosa Borici Composita are vaginal suppositories containing sodium perborate in a theobroma basis. —(Pharm. Ztg.)

Bonberger's Kissingen Pills contain rhubarb, extract of cascara sagrada and phenolphthalein.—(Pharm. Zent.)

Bran-O-Lax, according to the manufacturers, contains "one heaping tablespoonful of plain nutritious wheat bran condensed into tablet form." The A. M. A. Chemical Laboratory reports that Bran-O-Lax Tablets contain wheat bran, reducing sugar (probably glucose) in large amounts, a gummy substance, probably acacia, and about one grain of phenolphthalein per tablet. —J. Am. Med. Assoc., 75 (1920), 1083. (W. A. P.)

Brou's Injection, according to the Federal authorities, consisted essentially of acetates and sulphates of zinc and lead, morphine, water and a very small amount of alcohol.—(J. Am. Med. Assoc.)

Brunol is normal primary butyl salicylate. It is a liquid, immiscible with water, and is used as a dressing for burns and scalds, being applied on lint.—(Pract. Drug.)

Buccosperin are tablets containing copaiba, extract of buchu, salicylic acid and urotropine. They are used in gonorrhea.—(Pharm. Ztg.)

Butolan is beta-benzylphenol carbaminic ester. It is marketed in the form of colorless and odorless powder or in crystals. It is recommended as a vermifuge in 0.25 Gm. doses for children from 4 to 12 and 0.5 Gm. doses for older children and adults.—(Pharm. Zent.)

Bykoform is plastic mass containing paraformaldehyde used for filling dental cavities.—(Pharm. Ztg.)

Bykophen is an alkaline paste containing parachlorphenol and thymol, used for filling dental cavities.—(Pharm. Ztg.)

Cabona is a chocolate flavored emulsion of cod liver oil.—(Pharm. Zent.)

Cadechol is an addition product of camphor with desoxycholic acid. It is a white crystalline powder, melting at 180°, insoluble in water but soluble in hot alcohol and in alkali. It contains 15 per cent. of camphor and is marketed as tablets each of which contain 0.1 gramme of cadechol. It is claimed to have the therapeutic value of camphor without its drawbacks.—(Pharm. Ztg.)

Cagusil Tablets are said to contain a calcium-guaiacol-silica compound. They are recommended for pulmonary troubles.—(Pharm. Zent.)

Cagusol is a new name for cagusil.—(Pharm. Ztg.)

Cala are 0.5 gramme tablets containing calcium lactate.—(Pharm. Ztg.)

Cacaona is a cacao preparation containing 12 per cent. of calcium chloride. It is recommended in arterial sclerosis and in rachitis.—(Pharm. Ztg.)

Calcidin is claimed to be a mixture of iodine, lime and starch. In contact with water, the iodine and the lime react to form calcium iodide and calcium iodate.—(J. Am. Med. Assoc.)

Calcium Creosote or **Calcreose**, is a dark brown powder, partly soluble in water, which is said to contain in loose chemical combination equal weights of calcium and creosote. Its effect is the same as creosote but without the gastric irritation which usually accompanies the administration of this valuable drug.

The dose is 0.25 to 1.0 Gm. A formula for a similar compound in liquid form is given in the *Pharmaceutical Journal*.—(Am. J. Pharm.)

Caluro is catarrh inhalant containing coniferous oils, balsam of Peru, menthol and alcohol.—(Pharm. Ztg.)

Camagol is a mixture of calcium lactate with magnesium citrate. The addition of the magnesium should both increase the action of the calcium and make it more certain.—(Drug. Circ.)

Canol is a cream used in eruptions of the epidermis of animals. —(Pharm. Ztg.)

Caporit.—This substance, formerly known as Hyporit, has been subjected to an examination by J. Herzog who reports that a freshly prepared solution, containing 40.3 per cent. of available chlorine, after ten days still showed the presence of 37.8 per cent. of chlorine. After three months the same solution still showed the presence of 34.8 per cent. of chlorine. The solution had not been well-stoppered, but an ordinary cork stopper had been employed.—(Apoth. Ztg.)

Capta-Cora-Cream is a perfumed greaseless complexion cream. —(Pharm. Ztg.)

Caral is a form of compound solution of cresol containing 50 per cent. of cresol and 25 per cent. of soap.—(Pharm. Ztg.)

Carbankal is an eczema salve containing zinc oxide, precipitated sulphur, bismuth subgallate, perugen, aluminum acetate and petrolatum.—(Pharm. Ztg.)

Carbovan Tablets contain animal charcoal and magnesium carbonate.—(Pharm. Zent.)

Cariesin is a radium plaster to be applied in tuberculosis of the bones.—(Pharm. Zent.)

Caseosan is a cocaine solution containing about 5 per cent. of caseine. The percentage of cocaine is not given. According to the manufacturers, caseosan may be injected intramuscularly or intravenously in doses of 1 to 2 mils for local inflammations, stimulation of certain organs such as the glands of the breast and as a hemostatic.—Pharm. Zent., 61 (1920), 79. (R. P. F.)

Cassidy's 4X, according to the Federal authorities, consisted essentially of aloes, colocynth, resins, a small amount of a mercury salt, alcohol and water.—(J. Am. Med. Assoc.)

Catamin is an ointment, containing sulphur, zinc oxide, vegetable extracts and petrolatum.—(Pharm. Ztg.)

Catherol is a surgical lubricant.—(Pract. Drug.)

Cehasol is the trade name for ammonium sulphoichthyfossilicum.—(Pharm. Zent.)

Cello-Cresol is a liquid which is claimed to possess a high disinfecting value. It is a combination of cresol with a number of hydrocarbons of high molecular value, containing 20 per cent. of cresol. It is claimed to be fully as efficacious as is lysol, and superior to creolin. Its low price permits its general use. Besides the liquid form it is also on the market in the form of an ointment and a cerate.—(Pharm. Ztg.)

Cellu Flour is a specially pure cellulose in the form of flour. It is used as a means of filling out the reduced diets, as in the Allen treatment for diabetics. It satisfies hunger without furnishing nourishment. Cellu Flour, after admixture with bran, baking powder, eggs, "India gum," or liquid petrolatum in varying proportions, may be used for the preparation of imitation bread, muffins, etc.—J. Am. Med. Assoc., 74 (1920), 1577. (W. A. P.)

Cenoform is a yeast preparation, recommended in hoof and mouth disease.—(Pharm. Zent.)

Cerigen, a new English nutrient and tonic, is a proteid food, of the sanatogen type.—(Pract. Drug.)

Chelonin is a turtle serum for tuberculosis.—(Pharm. Ztg.)

Chenopin is a crystalline compound obtained from oil of chenopodium.—(Pharm. Ztg.)

Chenopin Worm Tablets contain in each tablet 0.03 Gm. santonin, 0.5 Gm. chenopin, 0.1 Gm. phenolphthalein, 0.1 Gm. aromatic powder and enough sugar to make 1 Gm.—(Pharm. Ztg.)

Chinamon is a tablet containing quinine, ammonia and lime, said to be of service in catarrh.—(Pharm. Ztg.)

Chinolysin is a fluid containing quinine made more soluble by the addition of antipyrine. It is dispensed in 2 mil ampuls containing 1 gramme of quinine.—(Pharm. Ztg.)

Chenosan is a preparation marketed as gelatine capsules containing oil of chenopodium and santonin. There are two sizes: one for children from five to ten; the other for older children. In the treatment there is also furnished as a purgative, a chocolate tablet containing jalap and resin of scammony.—(Pharm. Ztg.)

Chinosol or oxyquinolin sulphate, is a powerful, non-toxic antiseptic, somewhat stronger than mercuric chloride and considerably stronger than phenol. It is a feeble germicide, being weaker than phenol and much weaker than mercuric chloride. Chinosol is claimed to have marked analgesic power and to be an efficient deodorant. Chinosol is also marketed in the form of chinosol tablets 0.25 Gm.—(J. Am. Med. Assoc.)

Chloriment Tablets contain in each tablet 0.15 gramme of potassium chlorate, 0.15 gramme of borax and 0.002 gramme of menthol.—(Pharm. Ztg.)

Chlorlyptus is a chlorinated eucalyptus oil containing 30 per cent. of chlorine in relatively stable combination. It is claimed

to be a new chlorinated antiseptic, highly efficient as a wound antiseptic. It is proposed for use in local infections, burns and as an antiseptic in the alimentary and urinary tract. The investigation made in the A. M. A. Chemical Laboratory showed that Chlorlyptus is a feeble antiseptic, considerably weaker than eucalyptus oil.—(J. Am. Med. Assoc.)

Chlorosan is a preparation of chlorophyll, recommended in anemia. The claim that it is superior in action to Blaud's pills is contradicted by Loffler.—(Pharm. Zent.)

Chloroxyl or cinchophen hydrochloride is a yellow crystalline powder with an astringent, slightly bitter taste, insoluble in water. Chloroxyl is also supplied in the form of 5 gram tablets. —(J. Am. Med. Assoc.)

Cholaktol Tablets are sugar coated tablets, each containing 0.0125 Gm. of oil of peppermint.—(Pharm. Zent.)

Cholelith is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Cholsanin is a remedy for gall stones, said to contain calomel, podophyllum, ethereal oil and an extract containing the ingredients of Hufland's nervine species.—(Pharm. Zent.)

Cornupan is an ergot preparation.—(Pharm. Zent.)

Copper Alanine has been recommended by Dr. J. A. Shaw-Mackenzie in inoperable cancer. He states: "Copper compounds of amino-acids were prepared by me in the Physiological Laboratories, King's College. Although such compounds were not new, I directed particular attention to copper glycine and copper alanine. I found that they were soluble in serum without precipitating the serum protein, or other proteins, and that they had a marked toxic action on protozoa, which suggested the use of this form of copper intravenously, and its possible use in protozoal diseases and in cancer. Experimentally the method itself in suitable dosage was found to be harmless. With regard to

cancer, I pointed out that any treatment with this form of copper was of an entirely experimental character." He administers the copper alanine as injections in a 1 in 300 solution.—(Chem. & Drug.)

Cortenal Preparations contain the ingredients of cortenin along with other ingredients.—(Pharm. Zent.)

Cortenin is a powder containing silicic acid, guaiacol and calcium lactate.—(Pharm. Zent.)

Coryza-Serol, Merz is a salve containing menthol, novocaine and formaldehyde.—(Pharm. Zent.)

Cotin is a tobacco-stain remover.—(Pharm. Ztg.)

Cresatin is a meta cresol acetic ester which Barnert has found of value as an antiblennorrheic.—(Pharm. Ztg.)

Cresineol.—Upon cooling a mixture of a commercial sample of cresylic acid and oil of eucalyptus, T. T. Cocking obtained a number of large transparent crystals, composed of cineol and cresol. Experiments showed that only oil of eucalyptus containing orthocresol responded to crystallization.

This new compound now registered under the name of Cresineol, contains equal molecules of cineol and ortho-cresol. Its specific quantity is 0.9661 at 60° and refractive index $N_D = 1.4846$ at 60°.

It is soluble in ether, alcohol, chloroform, benzene and other organic solvents. It has a pleasant odor and is not caustic to the skin. Decomposition occurs with subsequent regeneration of cineol upon the addition of an aqueous alkali.—Pharm. J., 105 (1920), 81. (F. H.)

Cristolax is a combination of malt extract and paraffin, recommended as a laxative.—(Pract. Drug.)

Croftol is a disinfectant, consisting of an alkaline solution of tar acids.—(Pract. Drug.)

Crossman's Mixture, according to the Federal authorities, consisted essentially of an alcoholic solution of volatile oils including balsam of copaiba and cubebs.—(J. Am. Med. Assoc.)

Cu-Co-Ba Tarrant, according to the Federal authorities, consisted essentially of a mixture of extract of cubebs and copaiba with magnesium oxide.—(J. Am. Med. Assoc.)

Degrasin is a tablet form of thyroid extract used in obesity.—(Pharm. Zent.)

Delawa is a German hair lotion of secret composition.—(Pharm. Ztg.)

Delegon, used as a prophylactic for gonorrhea, are sticks 18 mm. long and 3 mm. wide, which contain 2 per cent. of protargol. Manufactured by P. Bayer & Co., Elberfeld.—(Pharm. Weekbl.)

Densatio is a toothache remedy consisting of gelatin capsules, a mixture of powders for internal use and pills to be inserted in the cavity.—(Pharm. Ztg.)

Densensin Tablets contain acetylsalicylic acid, salipyrine, quinine and guaiacol salts. They are used for grippe, colds and rheumatism.—(Pharm. Ztg.)

Dentino is a dentrifrice containing the volatile ingredients of drugs of the Iridaceæ and the Burseraceæ along with glucose and levulose.—(Pharm. Ztg.)

Dentozone is a form of tablet which when added to water gives off carbon dioxide and oxygen and produces a pleasantly aromatic mouth wash.—(Pharm. Ztg.)

Deranium Salt is marketed in the form of round thin white tablets containing phosphates, sulphates, chlorides and carbonates of the alkalies and the alkaline earths. It is used in arterial sclerosis.—(Pharm. Ztg.)

Dermasan Preparations include **jod-dermasan** used externally in gout and **copper-dermasan** used in lupus.—(Pharm. Ztg.)

Desintol is a water-soluble preparation of crude carbolic acid. It is used as a general antiseptic and disinfectant.—(Pharm. Ztg.)

Despyrol.—A mixture of acetylsalicylic acid 86 per cent. and potassium bitartrate 14 per cent. Also formerly known as "despyrin."—(Pract. Drug.)

Desko-Si Preparations are chocolate candies containing iron and silicium. There are three forms, green, red and gold and are recommended as tonics.—(Pharm. Zent.)

Diabetic Foods.—A report from the Connecticut Agricultural Experiment Station on diabetic foods includes not only the content of carbohydrate in these products but also that of protein and fat in view of the recognized necessity of taking into account all of the nutrients in any proper formulation of regimen for the diabetic patient.

There is no satisfactory definition of what a diabetic food is, nor is there any universal food. The value of accurate information regarding the makeup of such products as may find special application in the dietotherapy, such as given in the Connecticut report, lies in the fact that it enables clinicians and the patient to proceed intelligently in the direction of diet planning with a view to tolerance of all the nutrients. Of particular interest in the report are the analyses of bran, which is being widely used at present to give bulk to the food residues in the alimentary canal. It appears that common, unwashed bran frequently contains no more than half as much starch as some of the advertised brands of "health" bran.—J. Am. Med. Assoc., 75 (1920), 818. (W. A. P.)

Diacetylapomorphine is obtained by the action of acetic anhydride on apomorphine hydrochloride. It is said to be only half as toxic but twice as active as the latter.—(Pract. Drug.)

Diaferrol is an alcohol-free iron preparation that according to the manufacturers does not affect the teeth.—(Pharm. Ztg.)

Dialacetin is a hypnotic marketed in the form of tablets, each of which contain 0.1 Gm. diallybarbituric acid and 0.25 Gm. acetaminophenol allylether.—(Pharm. Zent.)

Didial-Ciba is a chemical combination of diallylbarbituric acid **(Dial)** with ethyl morphine containing 61.4 per cent. of the latter alkaloid. It is marketed in tablets, each of which contain 0.025 Gm. didial and in addition 0.1 Gm. dial. It is recommended as a hypnotic in insomnia.

Digiton is a preparation of the active ingredients of digitalis, marketed in ampuls and in tablets.—(Pharm. Ztg.)

Dijodyl is the di-iodide of ricinstearolic acid, $CH_3\ (CH_2)_5\ CHOH\text{-}CI{=}CI\text{-}(CH_2)_7COOH$. It is in the form of crystalline needles, of irregular melting point, containing 46.2 per cent. of iodine. It is supposedly preferable to alkaline iodides and is given in tablets containing 0.3 Gm. each.—(Pharm. Zent.)

Dimazon is diacetylamidoazotoluene, a dye chemically closely related to scarlet red. Like the latter it stimulates the growth of epithelium and is not as irritant as the scarlet red. It also possesses the advantage of being easily washed off and is, unlike the scarlet-R, practically stainless.—(Am. Drug.)

Dimenol is a solution of colloidal manganese and is alleged to be useful in the treatment of malaria and kindred blood affections.—(Am. Drug.)

Dimipetton is a trade name for a line of compressed tablets having across their center a depressed line that facilitates breaking them in half.—(Pharm. Ztg.)

Diphthosan Pastilles contain in each pastille 0.1 Gm. flavizid appropriately sweetened. It is dissolved in water and then used as a gargle.—(Pharm. Zent.)

Doloresum is a mixture of methyl salicylate, mustard oil and chloroform used for rheumatic pains. It is marketed as an oint-

ment *(unguentum dolores)* and as an oil *(oleum dolores).*—(Pharm. Ztg.)

Doraldina is a new hypnotic prepared by Paolini by combining bromine with pyramidon. This new compound contains about 23 per cent. of bromine and 77 per cent. of ethyl-pyramidon. It is administered hypodermically in doses of 0.5 gramme. Per os the dose is from 0.5 to 2 grammes, the latter is to be regarded as the maximum dose. It occurs in the form of white needles readily soluble in water, with a slightly bitter taste.—(Chem. & Drug.)

Duanti is a prophylactic preparation consisting of a package containing (a) Schereshowsky's quinine ointment, and (b) Some short urethral bougies containing choleval.—(Pharm. Ztg.)

Dubatol, upon analysis, shows presence of calcium, valerianic acid and a substance, which, upon oxidation with permanganate, produces benzaldehyde.—Pharm. Zent., 61 (1920), 67.

Dubois' Iodoleine or iodized poppyseed oil is an iodine addition product of poppyseed oil. It may be used whenever iodides are indicated, its effects being more gradually exerted. It is marketed as a fluid, in capsules and in ampuls.—(J. Am. Med. Assoc.)

Dogocin is a white powder containing organically combined iodine and also sulphur. It is recommended in rickets and scrofula.—(Pharm. Ztg.)

"Double Frost-Heal" is a dark brown salve, containing camphor and beta-oxynaphthyl-ortho-oxy-meta-tolylic acid. It is used to relieve the itching of frost-bite.—(Pharm. Ztg.)

Dumex Preparations are a line of German proprietaries, including a freckle lotion, gout drops, rheumatic pills and fluid and an antiseptic cooling ointment.—(Pharm. Ztg.)

Duploferrin is marketed in tablets containing iron nucleinate, sodium citrate and albumose. It is used in anemia.—(Pharm. Ztg.)

Duro Pastilles contain 0.03 Gm. gallic acid and 0.5 Gm. of an iron preparation in each pastille. They are used for dysentery.—(Pharm. Zent.)

Dynose is a preparation containing plant albumins.—(Pharm. Zent.)

Dysbacta is a prophylactic vaccine for bacillary dysentery, introduced by Boehncke. Opinions differ as to its value.—(Pract. Drug.)

Echitone is stated by the manufacturers to contain echinacea, blue flag and pansy. The drug echinacea has been claimed to be a "specific" for rattlesnake bites, syphilis, typhoid, malaria, diphtheria and hydrophobia. It has also been credited by enthusiasts with curative effect in tuberculosis, tetanus and exophthalmic goiter, and with the power of retarding the development of cancer. The Council on Pharmacy and Chemistry examined the claims made for this drug and reported that there was no reliable evidence in substantiation of the claims made for it. Echinacea is one of the many vegetable drugs introduced by the eclectics without a rational basis for their use.—J. Am. Med. Assoc., 75 (1920), 193. (W. A. P.)

Eckaine, or n—benzoyl hydroxy propyl norecgonidine ester is a crystalline base, giving a water-soluble hydrochloride which in neutral solution can be sterilized at 100° C. without decomposition. It is only slightly toxic, acts on the respiratory center similarly to cocaine but to a lesser degree, and is a powerful local anæsthetic. Its administration causes at first a lowering, often followed by an increase, of the blood pressure. The anesthetic action of other norecgonidine derivatives such as hydroeckaine, or the corresponding hydroxyethyl and hydroxyamyl compounds, is much weaker than that of eckaine. The tropic acid ester of homotrapine, *"mydriasine,"* acts on the pupil and vagus like atropine, and is an equally powerful mydriatic. In all these respects, it is superior to the benzoic and mandelic esters, and to the tropic acid ester of dimethylaminopropanol.—(J. Soc. Chem. Ind.)

Elbefa is a gauze wound dressing.—(Pharm. Zent.)

Electroferrol is a preparation for intravenous injection containing 0.5 per cent. of colloidal iron with a protective colloid, marketed in ampuls containing 1.25 or 5 mils of the fluid.—(Pharm. Ztg.)

Elzernac is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Energat is a solid peroxide preparation, free from sugar or other plant substances and used as a dental antiseptic.—(Pharm. Ztg.)

Enoob Antiseptic Capsules, according to the Federal authorities, consisted essentially of cubebs, copaiba, gum, turpentine and pepsin, with indications of santal oil.—(J. Am. Med. Assoc.)

Enoob Antiseptic Injection, according to the Federal authorities, consisted essentially of a solution of phenol, menthol, thymol, boric acid and zinc sulphate in water.—(J. Am. Med. Assoc.)

Epidosin Tablets contain methylene diguaiacol acetyl ester. —(Pharm. Ztg.)

Ericaine is a solution of tributylalcohol, reinforced with cocaine hydrochloride and recommended as a good anesthetic in dental surgery.—(Am. Drug.)

Escabyl is a veterinary preparation containing prolaphten (see below).—(Pharm. Ztg.)

Eubaryt is a hydrophile colloid of barium sulphate used in X-ray diagnosis.—(Pharm. Zent.)

Eucatropine or phenyl-glycolyl-methyl-vinyl-diacetonalkamine-hydrochloride, was first introduced as euphthalmine. It produces prompt mydriasis, free from anesthetic action, pain, corneal

irritation, or increase in intra-ocular tension. The effect on accommodation is slight and transient. Eucatropine is useful as an aid in opthalmoscopic examinations in place of atropine, homatropine, etc.—(J. Am. Med. Assoc.)

Eudidon-Opheyden is a grayish powder containing various nutritive salts.—(Pharm. Ztg.)

Eudocal is a new hypnotic derived from thebaine. Its chemical structure is like morphine and it is said to be superior to morphine as a narcotic.—(Pharm. Ztg.)

Eugitalis is a digitalis extract freed from saponins.—(Pharm. Ztg.)

Eukystol Tea is a mixture of drugs such as squill, triticum and betula and sold as a kidney tea.—(Pharm. Ztg.)

Eumarrol is claimed to be the active constituent of *Aesculus hippocastanum*.—(Pharm. Zent.)

Eumatose-Piam is an Italian surrogate for Somatose.—(Pharm. Zent.)

Eumictine, according to its American agent, contains in each capsule 20 centigrammes of santalol, 5 centigrammes of salol and 5 centigrammes of hexamethylene tetramine. The Council on Pharmacy and Chemistry report that it is ineligible for New and Nonofficial Remedies.—(J. Am. Med. Assoc.)

Ex Lax is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Exurgine is a proprietary containing phenolphthalein.—(J. Am, Med. Assoc.)

Fecto is a chlorine disinfectant, described as an aqueous solution of alkaline hypochlorites with a trace of free chlorine. It is a colorless fluid, and when suitably diluted is not irritating to mucous membrane or exposed tissues.—(Pract. Drug.)

Felamin is a remedy used in the treatment of gall stones and is a combination of hexamethylenamine with the potent constituents of oxgall. When dry it is a white or greenish-white powder, rather hygroscopic, very soluble in water and possesses a sweetish-bitter taste. It is marketed in the form of sugar coated tablets each containing 0.3 Gm. of active material.—(Schwerz. Apoth. Ztg.)

Felcystina is a radium preparation, marketed in tablets, recommended for gall stones and for liver trouble.—(Pharm. Zent.)

Felliment is a German rheumatic lotion of secret composition. —(Pharm. Ztg.)

Ferrovarial is a combination of novarial with iron. It is marketed as sugar coated tablets and is recommended in anemia and amenorrhea.—(Pharm. Ztg.)

Flavizid is the name applied to an acridin coloring matter. Chemically it is known as 2, 7-dimethyl-3-dimethylamino-6-amino-10 methyl-acridin chloride. It is claimed to be able to destroy the staphylococcus and diphtheria microorganisms in solutions 1-320,000.—(Dtsch. Med. Wschr.)

Florasan Preparations are a line of liquids and solids containing aromatics and antiseptics to be added to water before bathing.—(Pharm. Ztg.)

Fluidcystol is a "perextract" containing uva ursi and herniaria. It is used in bladder troubles.—(Pharm. Zent.)

Fogyl are tablets containing bencinnozat, sodium peroxide, eucalyptol, menthol and malycyl.—(Pharm. Zent.)

Formicin is an equimolecular compound of formaldehyde and acetamide. It is yellowish syrupy liquid with a faint formalin odor and an acid, slightly bitter taste. It is soluble in alcohol and water. The solution in water slowly evolves formaldehyde gas at room temperature, hence its use as a local antiseptic. It is practically non-toxic.—(Am. Drug.)

Formitol Tablets, according to the manufacturer, contains ammonium chloride, benzoic acid, citric acid, guaiac, hyoscyamus, menthol, paraformaldehyde and tannic acid. An analysis made by the chemist of the American Medical Association indicated that the combined weight of all the claimed active ingredients is less than one grain per tablet.—(J. Am. Med. Assoc.)

Frangulax are tablets containing frangula extract.—(Pharm. Zent.)

Fruit-A-Tives, according to the Federal authorities, consists essentially of extracts of aloes, nux vomica and cinchona bark. —(J. Am. Med. Assoc.)

Fumo-Taracine is an English specialty similar to the American vapocresoline, used as a fumigating disinfectant for prophylactic purposes.—(Pract. Drug.)

Gaiarsol is a solution of guaiacol methyl arsenate.—(Pharm. Zent.)

Galkola is a veterinary preparation for hoof and mouth disease. It consists of a dusting powder to be applied to the hoof and a liquid for washing out the mouth.—(Pharm. Ztg.)

Gastrozymase are tablets containing the enzymes of the gastric fluid.—(Pharm. Zent.)

Gelatin Tannate is prepared by precipitation from solutions of gelatin and tannin. To 10 parts of gelatin dissolved in about 800 of water, is added 12 of tannin dissolved in 200 of water. The precipitate, collected and dried, is a white, odorless, tasteless powder, insoluble in water or in acids, but soluble in alkalises. It is a valuable intestinal astringent, being given in doses of 8 grains from four to eight times daily. It replaces foreign-made organic tannin compounds.—(Pract. Drug.)

Gerastyl is claimed to be the hemostatic constituent of Geranium maculatum.—(Pharm. Zent.)

Germosan Powder contains amidophenazon, salipyrine, quinine, caffeine citrate, ammonium valerate, menthol and urethane. —(Pharm. Zent.)

Gloversol is a liquid soap containing phenol.—(Pharm. Zent.)

Glucarsenol is a combination of novarsenobenzol, supplied in "ampul syringe" form for intramuscular injection.—(Pract. Drug.)

Green's Dropsy Remedy is sold on the mail order plan and comes in the form of large balls or boluses, some smaller balls or boluses and, in some cases, includes "Tonic Tablets." The balls are taken, followed by substantial doses of magnesium sulphate. The A. M. A. Chemical Laboratory reports that the boluses, large and small, appear to contain powdered squill as their chief medicinal ingredient. The laboratory further reports that the "Tonic Tablets" contain an iron salt, probably dried ferrous sulphate, as the chief medicinal ingredient.—J. Am. Med. Assoc., 74 (1920), 689. (W. A. P.)

Glycerophoscalin is a form of compound syrup of glycerophosphates.—(Pharm. Ztg.)

Glycerophoscula are 0.5 gramme tablets containing calcium lactate and calcium glycerophosphate.—(Pharm. Ztg.)

Glycyl is a salicylic ester of glycerin dissolved in double its weight of alcohol. It is used as a rheumatic liniment.—(Pharm. Zent.)

Glykylol is a cataplasm of kaolin containing boric acid, sodium salicylate, salicylic acid, potassium tetraborate, thymic acid and volatile oils.—(Pharm. Ztg.)

Gonocystal is marked in the form of keratin coated pills, that are said to contain the lactic acid ester of sandalwood oil and extract of kava kava.—(Pharm. Zent.)

Grale's Fruit Laxative, while advertised with the claim, "Grale's Fruit Laxative contains only figs, dates, raisins and prunes, a few simple herbs and bran. No DRUGS AT ALL," contains according to the chemists of the American Medical Association, ground senna.—(J. Am. Med. Assoc.)

Green Mountain Herb Tea, according to the Federal authorities, consisted essentially of senna, fennel, elder flowers, anise, triticum, sassafras, American saffron, coriander, licorice root, butternut bark, buckthorn and epsom salt.—(J. Am. Med. Assoc.)

Gregory's Antiseptic Oil, according to the Federal authorities, consisted essentially of kerosene oil with oil of cloves, cassia, sassafras with a trace of camphor and pepper resins.—(J. Am. Med. Assoc.)

Grimault's Injection, according to the Federal authorities, consisted essentially of a weak aqueous solution of copper sulphate and plant extractives, probably matico.—(J. Am. Med. Assoc.)

Grippephylaxin consists of tablets, containing phenacetine, acetylsalicylic acid, salipyrine and morphine hydrochloride.—(Pharm. Ztg.)

G. U. C. Capsules, according to the Federal authorities, consisted essentially of a sulphurated oil, with volatile oils, including copaiba, cinnamon and santal oils.—(J. Am. Med. Assoc.)

Guajacetin is the sodium salt of pyrocatechinmonoacetic acid. It is used as an antipyretic and in tuberculosis.—(Drug. Circ.)

G. Zit, according to the Federal authorities, consisted of bougies containing oil of theobroma and a silver compound.—(J. Am. Med. Assoc.)

G. Zit Antiseptics, according to the Federal authorities, consisted essentially of oils of copaiba and cubeb and a compound of sulphur.—(J. Am. Med. Assoc.)

Hadal is a mixture of ammoniated mercury, sulphur and oil of chaulmoogra. It is used for skin troubles.—(Pharm. Zent.)

Haelepron is a form of medication, containing hemoglobin, lecithin, vegetable protein, calcium lactate, ferric pyrophosphate and saccharated iron. It is used as a chalybeate and nutrient tonic.—(Allg. Med. Central-Ztg.)

Hamarsan is an iron tonic.—(Pharm. Ztg.)

Haemarsin is a combination of cacodylic acid, calcium glycerophosphate and strychnine, applied by intramuscular injections, for anemia.—(Pharm. Ztg.)

Haemokalk is marketed in the form of brown sugar-coated tablets containing hemoglobin and calcium glycerophosphate.—(Pharm. Ztg.)

Haemoson is a powder consisting of magnesium peroxide, malt lactose lecithin, etc. It is advertised as a remedy for gout.—(Pharm. Ztg.)

Haenealin Head Lotion is a vermin lotion of secret composition.—(Pharm. Ztg.)

Haloform is a smelling salt to be used in rhinitis.—(Pharm. Ztg.)

Halz Injection, according to the Federal authorities, consisted essentially of zinc sulphate, boric acid, glycerin, alum, formaldehyde and water.—(J. Am. Med. Assoc.)

Hegaform is a combination of formaldehyde and calcium salts, marketed in tablet form, said to be good in influenza.—(Pharm. Ztg.)

"Heilsalbe Seidencreme" consists of 120 parts of lanolin-petrolatum, 16 parts of zinc oxide, 16 parts of olive oil, 6 parts of

sodium borate, 4 parts of glycerin, 0.8 part of phenol, 0.5 part of eugenol and 50 parts of a 10 per cent. infusion of *Stachys anatolia*. —(Pharm. Zent.)

Heliozone Dragees contain menthol and peroxides and are used in influenza.—(Pharm. Ztg.)

Hemagulen is prepared from fresh brain tissue and is used for nose bleed. It is a Lilly product.—(Pharm. Zent.)

Hemoplase, a Lumiere specialty, is said to be hemoglobin in its natural and most assimilable form, recommended as a tonic in the treatment of anemia.—(Pract. Drug.)

Heparcholine is a secret remedy for gall-stones, which is marketed as pills.—(Pharm. Ztg.)

Heptola is one of the many treatments claimed to remove gallstones. Analysis showed Heptola to be the same old gallstone trick—that of giving the patient a large dose of some bland oil and following it up with a saline. The soapy concretions that are voided following this dosing are the "gallstones." Heptola is essentially the same as Frutola and Mayrs Stomach Remedy. —J. Am. Med. Assoc., 74 (1920), 752. (W. A. P.)

Herdrol is a remedy for dogs.—(Pharm. Ztg.)

Hernigon is the name given to gelatin capsules, containing herniaria extract, kava-kava and ethereal oils. They are employed in inflammatory conditions of the urinary tract. (Pharm. Ztg.)

Herpelibrin Liquid contains potassium sulphide, phenol, colorless tar soap and tincture of soap.—(Pharm. Zent.)

Heskimal, according to its manufacturers, contains the salts of magnesium, calcium, aluminum, iron and silicic acid. It is used in intestinal troubles.—(Pharm. Ztg.)

Hesperonal-calcium is the calcium salt of a saccharophosphoric acid. Its actions is the same as candiolin.—(Drug. Circ.)

Hexacystol is marketed in the form of tablets containing diosphenol diosmin and hexamethylanamine.—(Pharm. Zent.)

Hexagon, according to the Federal authorities, consisted essentially of an aqueous solution of zinc sulphocarbolate, boroglyceride and bismuth subnitrate.—(J. Am. Med. Assoc.)

Hinkle Capsules, according to the Federal authorities, consisted essentially of powdered cubeb, copaiba and cannabis indica.—(J. Am. Med. Assoc.)

Homa is a nutritive chocolate.—(Pharm. Zent.)

Homosan is a new name for haematogen.—(Pharm. Ztg.)

Hostetter's Bitters is declared to contain 25 per cent. of alcohol. Analysis in the past have shown that the alcohol content has varied widely at different times, the amount having never been less than 25 per cent. by volume, but sometimes as high as 43 per cent. A recent analysis by the A. M. A. chemists showed 24.72 per cent. of alcohol by volume, small quantities of cinchona alkaloids (about ¾ grain per fluidounce) and no other therapeutically active ingredients in appreciable quantities. Six fluidounces of the preparation (6 doses) were dealcoholized, the solution evaporated; the residue mixed with milk sugar, the mixture placed in capsules, and the capsules swallowed at one dose by a healthy man. No effects were noted.—J. Am. Med. Assoc., 74 (1920), 1534. (W. A. P.)

Hukra Tea is claimed to be a mixture of "Herba, Galeopsidis, Grandifl, Herba Polygalae amarae, Folia Tussilag, Farfarae, Lichen islandicus, Fructus Phellandrii aquatici, Fructus anisi, Fructus Foeniculi, Radix Liquiritiae." It is used in colds and throat troubles.—(Pharm. Ztg.)

Humagsolan is a hair restorative made by hydrolyzing horny tissue by boiling with diluted acids. H. Blaschko found it gave

good results especially when used in connection with electric treatments. Good results are also reported in cases where the hair was dry and brittle, splitting and breaking off continually. He also mentions a case of trophic nail disease, in which the nails were badly discolored, grooved and split. After three months treatment with Humagsolan a distinct improvement was observed.—Pharm. Zent., 61 (1920), 386. (O. M.)

Hyatt's A. B. Balsam, according to the Federal authorities, consisted essentially of potassium iodide, alum, Epsom salt, plant extractives, unidentified alkaloids, sugar, glycerin and alcohol. —(J. Am. Med. Assoc.)

Hydroperate is the trade name for a 30 per cent. hydrogen dioxide solution.—(Pharm. Zent.)

Hymetarol is a surrogate for eneosol.—(Pharm. Zent.)

Hypno-Bromic Compound is sold by druggists without prescription, though it contains in each ounce; cannabis indica, 1 grain; morphine, ¼ grain; potassium bromide, 48 grains; hyoscyamus, 1 grain; chloral hydrate, 96 grains. A specialist writes that he has three young women who have become addicts to the preparation as a result of thoughtless prescriptions from physicians. By visiting the various drug stores in town, these addicts have been able to obtain an ample supply of the preparation. Hypno-Bromic Compound is more than an unscientific mixture; it is a dangerous product that should not be sold indiscriminately over the drug counter.—J. Am. Med. Assoc., 74 (1920), 410. (W. A. P.)

Ichthynat is an aqueous solution, the important medicinal constituents of which are ammonium compounds containing sulphur in the form of sulphonates, sulphones and sulphides. These characteristic forms of sulphur result from the sulphonation of the tarlike distillate obtained from certain bituminous shales.— (J. Am. Med. Assoc.)

Ichtulfon is an ammonium compound ichtulfon-sulphonic acid. —(Pharm. Ztg.)

Idramint is a new name for Riedel's paraformaldehyde tablets. —(Pharm. Ztg.)

I. G. O., according to Dr. H. S. Lambdin, Peru, Kansas, is a saturated solution of iodine gas in petrolatum at 130°, with oil of eucalyptus. The heat of the body liberates the iodine and it is absorbed as free iodine. The A. M. A. Chemical Laboratory reports, that the sample of I. G. O. was a black ointment, green in thin layers, with a slight odor like crude petroleum, containing but 0.59 per cent. of free iodine.—(Chem. Abs.)

Indian Wyanole, according to the Federal authorities, consisted essentially of chloroform, ammonia, menthol, glycerin, turpentine-like oils, alcohol and water.—(J. Am. Med. Assoc.)

Injectio Neurotrophica Behamed contains sodium glycerophosphate, 0.1 gramme; sodium monomethyl-arsinicum, 0.05 gramme and strychnine sulphate, 0.0005 gramme in each ampul. —(Pharm. Ztg.)

Injection Cadet, according to the Federal authorities, consisted of diluted aqueous solution of copper sulphate and unidentified plant material.—(J. Am. Med. Assoc.)

Injection Zip, according to the Federal authorities, consisted essentially of acetates and sulphates of zinc and lead, opium, berberine, plant extractives, alcohol and water.—(J. Am. Med. Assoc.)

Inusal is a remedy for mange in horses. It is said to contain paraffin ethereal oil and tar distillates.—(Pharm. Ztg.)

Iodex and Liquid Iodex.—The A. M. A. Chemical Laboratory examined Iodex in 1915 and found that it contained only traces of free iodine though claimed to contain "5 per cent. therapeutically free iodine." Even the total quantity of iodine was shown to be only about one-half of the 5 per cent. claimed to be present as free iodine.

An analysis of the Iodex sold in 1919 demonstrated that the preparation is essentially the same as that sold in 1915, that is, it was found to contain no free iodine and only about three-fifths of the total amount of iodine claimed. The laboratory further reports that Liquid Iodex, sold with the claim that it is a preparation having the properties of free iodine, is a reddish liquid with an odor like oleic acid, containing but little (0.16 per cent.) free iodine and only about three-fifths of the total iodine claimed. —J. Am. Med. Assoc., 74 (1920), 3759.

Ittiolo is an Italian preparation of ammonium sulphoichthyloate, designed to replace ichthyol.—(Pract. Drug.)

Izal is a 45 per cent. emulsion of izal oil, the latter being obtained by distilling soap in a specially constructed oven. It occurs as a red brown, clear liquid and is heavier than water in which it is not soluble. It distils between 205 and 350° and is therefore free from phenol. It also does not contain hydrocarbons. A 0.2 per cent. solution of the emulsion inhibits the growth of *Staphylococcus pyogenes aureus* in 10 minutes and a one per cent. solution that of the anthrax bacillus in 30 minutes. The product which, therefore, is much stronger than carbolic acid is recommended as substitute for other germicides of a similar composition used for disinfecting purposes and for killing vermin of all kind.—(Pharm. Weekbl.)

Jarabe de Abrozine, according to the Federal authorities, consisted essentially of terpin hydrate, menthol, benzoic acid, ammonium chloride, sodium bromide, glycerin, alcohol, sugar and water.—(J. Am. Med. Assoc.)

Jenkin's Rheumatism Annihilator, according to the Federal authorities, contains over 46 per cent. of alcohol, salicylic acid, resinous plant extract and water.—(J. Am. Med. Assoc.)

Jodamidon Ravasine is a 50 per cent. aqueous solution of iodoamidopyrine. It contains 35.8 per cent. of iodine. (Pharm. Zent.)

Jodcalcirin and **Bromcalcirin** are iodine and bromide compounds of calcium diglycolate, calcium chloride and sodium cholate. Bornstein finds them preferable to alkaline iodides and bromides.—(Pharm. Zent.)

Jodocollargol is a colloidal silver iodide dispensed in ampuls. —(Pharm. Ztg.)

Iodicin is an organic compound of iodine.—(Pract. Drug.)

Jodincarbon is **incarbon** which has absorbed iodine. It is used in veterinary practice as a remedy for anthrax.—(Pharm. Ztg.)

Jodokalin are tablets each containing 0.25 Gm. of potassium iodide.—(Pharm. Ztg.)

Jodkynazon, see Kynazon preparations.

Jodolipina is an Italian for Iodopin.—(Pharm. Zent.)

Jodolyte is an iodine preparation of unstated composition.—(Pharm. Ztg.)

Jubelitoires are pills containing eumarrol, **resorthan, gerastyl** and adrenaline.—(Pharm. Zent.)

Jucksin is an exterminator of animal and house vermin.—(Pharm. Ztg.)

Kalk-Appeton are 0.6 Gm. tablets containing iron albuminate, magnesium peroxide and calcium lactophosphate.—(Pharm. Ztg.)

Kampfmueller's Rheumatic Remedy, according to the Federal authorities, consisted essentially of potassium iodide, plant extractions, alcohol and water.—(J. Am. Med. Assoc.)

Kaposavon is a soap containing tar, sulphur, borax and naphthol.—(Pharm. Zent.)

Katalysin contains iron, lecithin bases and creosote. Lunz found it useful in influenza.—(D. A. Apoth. Ztg.)

Kepholin is the hemostatic phosphatide obtained from spinal cord and brain tissue. A suspension containing 0.1 to 0.2 per cent. is normal saline solution is applied to bleeding or oozing surfaces.—(Pract. Drug.)

Kline's Nerve Restorative.—In 1915 the A. M. A. Chemical Laboratory reported on this alleged epilepsy remedy, that essentially each 100 mils of the solution contained approximately 8.7 grammes of ammonium bromide, 9.2 grammes of potassium bromide and 8.0 grammes of sodium bromide. Calculated from the bromide determination, each mealtime dose contained the equivalent of 17.2 grains of potassium bromide.—(J. Am. Med. Assoc.)

Knoll's Nutritive Juice is a blood preparation in which the hemoglobin has been converted into albumoses. The product has the pleasant taste of a meat extract.—(Pharm. Zent.)

Knoxit Globules, according to the Federal authorities, consisted essentially of a mixture of volatile and fixed oils and oleoresins, including copaiba, cinnamon and cassia.—(J. Am. Med. Assoc.)

Knoxit Injection, according to the Federal authorities, consisted of a solution of zinc acetate with alkaloids of hydrastis, in glycerin and water.—(J. Am. Med. Assoc.)

Kolibrin is a remedy for colic in horses and cows; a green fluid smelling of peppermint.—(Pharm. Ztg.)

Konfect is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Kratzurgan contains salicylic acid, sulphur and petrolatum. It is used in the itch.—(D. A. Apoth. Ztg.)

Krusa Chamomile Essence is an alcohol-free chamomile infusion, prepared according to the manufacturers "by an electrochemical method."—(Pharm. Ztg.)

Krysolgen is a suggested improvement over aurocantan. The latter which is chemically cantharidyl ethylenediamine aurocyanide, has not proved successful because, on investigation, the cyanogen antagonizes the gold. For that reason a complex gold combination was necessary; the sodium salt of 4-amino-2-aurothiophenol-1-acid carbonate, sold by Hochst under the name of krysolgen. The value of this gold salt (it containing 50 per cent. of gold) is the physical or biological value of the gold. From the physical or chemical standpoint gold assists oxidation in tuberculous organisms; biologically it assists in the formation of normal and specific protecting bodies encircling the tubercle bacilli.—(Drug. Circ.)

Kupfer Dermasan is an ointment containing copper. One form contains 0.3 per cent. Cu., the other, 0.15 per cent. Cu. It is recommended for lupus. (Pharm. Zent.)

Kutin is a non-fatty face cream of secret composition.—(Pharm. Ztg.)

Kynazon Preparations are bromine and iodine compounds of the leuco forms of certain aniline dyes that are of antiseptic value.—(Pharm. Ztg.)

Lactocreosota Syrup is a substitute for the French preparations **Sirop Famel.** It is used in colds and pulmonary troubles. —(Pharm. Ztg.)

Lactoferrose is a mixture of ferrous lactate and calcium phosphate and lactate, marketed in the forms of red sugar-coated tablets.—(Pharm. Ztg.)

Lavacet is an aromatic toilet vinegar of secret composition.—(Pharm. Ztg.)

Laxirconfect is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Laxophene is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Laxoras is a pleasantly flavored petrolatum intended for internal use.—(Pharm. Ztg.)

Laxothalen Tablets is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Lenicet Preparations are a line of pharmaceuticals containing lenicet, a patent form of aluminum acetate having the formula $Al(OH)(CH_3COO)_2$. Among the preparations are **formalin-lenicet paste, lenicet bandages for burns, lenicet tooth paste** (or lenidont tooth paste) and **lenicet tooth powder** (or lenidont tooth powder).—(Pharm. Ztg.)

Lenisan Cream is a mixture of solution of aluminum acetate with petrolatum.—(Pharm. Zent.)

"Lepso"-Epilepsy Cure, like most epilepsy "cures," was found by the A. M. A. Chemical Laboratory to be essentially a bromide mixture. It was found to contain the equivalent of 51 grains of potassium bromide to the dose.—(J. Am. Med. Assoc.)

Liebig's Diarrhea Cordial, according to the Federal authorities, consisted essentially of a solution of morphine sulphate, catechu, tannin, oil of cassia, oil of peppermint, sugar, alcohol and water. —(J. Am. Med. Assoc.)

Linalgit is a compound ointment of arnica recommended for hemorrhoids.—(Pharm. Zent.)

Liphagol is a fatty tooth paste containing Carlsbad salts.—(Pharm. Zent.)

Listinol is dioxybenzolaluminum iodide, introduced by the Temmler Chemical Works, Detmold, Germany. It is used in the form of a solution in the treatment of catarrh.—(Am. Drug.)

Lutein Solution is supplied by Hynson, Westcott and Dunning of Baltimore, in ampuls containing one mil of solution, which represents the purified and water-soluble extractive of two

decigrams (3 grains) of dried corpora lutea of the sow. The solution as furnished is ready for use and is administered by intramuscular injection. Lutein is also furnished in tablet form.—(Am. Drug.)

Lyko is claimed to stimulate the appetite, tone up the digestive organs and to have laxative qualities. It is said to contain caffeine, kola, phenolphthalein and cascara sagrada. As result of an exhaustive examination, the A. M. A. Laboratory concludes the Lyko is essentially a sweetened solution containing about 22.2 per cent. of alcohol together with insignificant amounts of caffeine, cascara extractives and phenolphthalein.—(J. Am. Med. Assoc.)

Madagam is a German secret remedy for diseases of the stomach and intestines.—(Pharm. Ztg.)

Magnol is a disinfectant of secret composition.—(Pharm. Ztg.)

Maklasan is a remedy for hoof and mouth disease containing according to the Chamber of Agriculture of Munster, sugar, calcium carbonate and magnesia.—(Pharm. Zent.)

Malicyl is said to be the trade name for the volatile oil of Melaleuca viridifolia.—(Pharm. Zent.)

Malidrosa is an ointment of secret composition recommended for sweating feet and arm pits.—(Pharm. Ztg.)

Maltosellol is the name given to a preparation containing cod-liver oil, extract of malt, cacao and hypophosphite of sodium and calcium.—(Pharm. Ztg.)

Malydor Injection, according to the Federal authorities, consisted essentially of a dilute aqueous solution of boric acid, phenol, a zinc salt, acetanilide and unidentified plant material.—(J. Am. Med. Assoc.)

Manaxol is a weakly alcoholic solution of formaldehyde (1%) containing thymol and possibly absinthium. It is advertised as a remedy for sweaty armpits.—(Pharm. Ztg.)

McDowell's Ginseng Bitters, according to the Federal authorities, consisted of a solution of a plant extract containing small quantities of glycerin and a zinc salt.—(J. Am. Med. Assoc.)

McGraw's Liquid Herbs of Youth, according to the Federal authorities, consisted essentially of Epsom salt, senna, red pepper, quassia, alcohol, water and wintergreen flavor.—(J. Am. Med. Assoc.)

Mendelhall's No. 40 has been analyzed by the Federal authorities, and found to consist essentially of potassium iodide, cathartic resins, ammonium acetate, glycyrrhiza, glycerin, sugar, alcohol and water.—(J. Am. Med. Assoc.)

Menolysin is a yohimbin preparation recommended for painful menstruation.—Pharm. Zent., 61 (1920), 303.

Menthol Antistaphine is a gargle containing the two ingredients just mentioned.—(Pharm. Ztg.)

Mentubex is a rheumatic balsam containing menthol and methyl salicylate.—(Pharm. Ztg.)

Mercaffin is a mercurous compound of trimethyl-dioxyperin. It is recommended as an antiseptic against spirochetæ in veterinary practice.—(Pharm. Ztg.)

Mercedan represents a combination of mercury and sodium with paranucleinic acid. It is marketed in ampuls and each mill of the preparation is the equivalent of 0.025 Gm. of mercury. Mercedan Tablets, for internal administration contain a tannic acid compound of paranucleinate of mercury, each tablet be the equivalent of 0.01 of mercury.—(Pharm. Ztg.)

Mercurochrome-220 is stated to be dibromooxymercury fluorescein. It is a red powder, insoluble in water but soluble

in alkalies. According to Young, White and Swartz, mercurochrome-220 is a strong and rapidly acting germicide which penetrates the tissues readily and is tolerated in 1 per cent. solutions by the bladder, renal pelvis and urethra. Only temporary discomfort is caused when a 2.5 per cent. solution is applied to the anterior urethra. Its toxicity is high, but no systematic effects have been observed following its local application.—(J., Am. Med. Assoc.)

Mercury Bromide differs from mercuric chloride in being less soluble in water, alcohol and ether. Solubility is increased by adding to the solution potassium or sodium bromide; used internally and hypodermically as a remedy for syphilis.—(Am. Drug.)

Mercury Lactate, obtained by treating mercury oxide with 10 per cent. lactic acid; a white crystalline powder soluble in water; used hypodermically in 1 per cent. solution and internally mixed with sugar, water and milk.—(Am. Drug.)

Mersalv is a non-greasy mercurial cream said to contain 10 per cent. of metallic mercury.—(Pharm. Era.)

Metacholesterol, a patented article is mixed with melted fats or fixed oils. Ointments and emulsions thus obtained are very pale in color, homogenous and uniform, and possess the advantage of being miscible with large amounts of water. It is claimed that metacholesterol melted with 2% of petrolatum, is capable of taking up 500% of water.—(J. Soc. Chem. Ind.)

Metharfer is a solution of iron methylarsenate dispensed in in ampuls.—(Pharm. Ztg.)

Metharsol is a solution of sodium methylarsenate dispensed in ampuls.—(Pharm. Ztg.)

Methylhydrastinine is a synthetic product having the formula C_{12} H_{14} O NO. It is a yellow or greenish yellow powder melting at 213° with decomposition. It is used as a hemostatic. —(Pharm. Ztg.)

Metrotonin is an ergot surrogate containing ortho-dioxyphenylethanol, methylamine, acetylcholine, sparteine and aromatic quaternary amines. It is a sterile solution dispensed in 1 mil ampuls and is used in subcutaneous or intramuscular injections.—(Pharm. Ztg.)

Mitin is an ointment base made by emulsifying certain fats. It contains 50 per cent of a serum-like fluid.

Mivalicma is a remedy for hoof and mouth disease.—(Pharm. Zent.)

Molevac is a combination of liquid paraffin of high viscosity with malt extract and cascara evacuant. In chronic constipation the dose is one teaspoonful after or between meals or at bedtime, gradually increased.

Monarsone, a new anti-syphilitic, is disodium monoethylarsone, $CH_3\ CH_2AsO(NaO)_2$; it contains 7 per cent more arsenic than arsenobenzol, is decidedly less toxic than the arsenobenzol compounds, is perfectly soluble in small quantities of water, and may be given without danger in solution containing 0.2 Gm. per Cc. Monarsone has no hemolytic action on the red corpuscles, and may be given intravenously without fear of extravasation, as leakage causes no untoward effect. It requires no special apparatus for its administration, and its solutions are so stable that they resist oxidation or decomposition when boiled or subjected to the higher temperatures of the autoclave.—(Pract. Drug.)

Moorsan-Packungen is a combination of turf and salts from Aibling with esters of salicylic acid.—(Pharm. Ztg.)

Morphantosan Tablets are phantosan tablets containing morphine.—(Pharm. Ztg.)

Multanin is basic tannic acid aluminum.—(Drug. Circ.)

Musser's Capsules, according to the Federal authorities, consisted essentially of copaiba, oil of santal with indications of oil of cubeb and oil of mace.—(J. Am. Med. Assoc.)

Mycoleum is a tuberculosis "cure" developed by Dr. B. S. Paschall, consisting of the wax from the capsule covering tuberculosis germs. The *New York Times* of February 27th had a 1½ column account of new remedy.

Myocardol are tablets each of which contain 0.2 gramme of ergotin and 0.02 gramme of caffeine. It is used in irregularities of the pulse and in nervous disturbances of the heart.—(D. A. Apoth. Ztg.)

Nahrsaft-Knoll is a dark-brown thick fluid having the taste of extract of beef, containing, according to the manufacturers, 30 per cent of albumin, calcium, magnesium and iron salts and also lecithin and cholesterin.—(Pharm. Ztg.)

Narcophaine is a combination of the meconates of morphine and of narcotine, which in the form of a mixture with a derivative of quinine, is also known under the name of amnesine. Lactate of morphine and of narcotine is sometimes employed in place of the meconate.—(Pharm. Era.)

Nature's Creation, according to the chemists of the American Medical Association, consists essentially of a solution of potassium iodide in a weakly alcoholic medium, containing vegetable extractives and flavoring matter and small quantities of inorganic salts.—(J. Am. Med. Assoc.)

Neoarsaminol is a brand of neoarsphenamine (the drug first introduced as neosalvarsan) which complies with the standards of New and Nonofficial Remedies. It is manufactured under the neosalvarsan patent by license of the U. S. Federal Trade Commission, and is supplied in tubes containing, respectively, 0.15 Gm., 0.3 Gm., 0.45 Gm., 0.6 Gm., 0.75 Gm., and 0.9 Gm.—(Pract. Drug.)

Neoglycerin is a glycerin surrogate, that is claimed to be a pure organic body.—(Pharm. Ztg.)

Neoichthargan is an ichthyol compound containing 12.5 per cent of silver. It is used in skin troubles preferably as a 2 per cent. ointment.—(D-A. Apoth. Ztg.)

Nirvanol.—*Poisoning by.*—Gollimer reports a case where a woman took 10 or 12 tablets of nirvanol, 0.5 gramme each. After three days' treatment the patient recovered.—Dtsch. med. Wsch., through Pharm. Zent., by (1920), 123.

Nitrogen syrup is made by digesting brewers' yeast in syrup for three or four hours at 50° to 55° C. and filtering. Syrups containing 2.4 per cent of protein and possessing a maltlike flavor result.—(Am. Drug.)

No. 7 Paraffin consists of resorcin 1 (or betanaphthol, 0.25); oil of eucalyptus, 2; olive oil, 5; hard paraffin, 67; petrolatum, 25. Method of application: The burn is washed with sterile water and carefully dried; a layer of the melted paraffin is then painted on and covered with a thin layer of cotton wool; a second layer of melted paraffin is applied over that, and the whole covered with wool and a bandage. The dressing is changed daily at first, later every second day.—(Am. Drug.)

Noratropine is homatropine-methyl-nitrate. Konradi recommends it in tuberculosis night sweats and in diarrhea.—(D. A. Apoth. Ztg.)

Normosal is the ash from blood serum, containing the bicarbonates and acid phosphates of sodium potassium, calcium and magnesium. It is dispensed in ampuls from which solutions that are inorganic sera may be produced.—(Pharm. Zent.)

Novadeps is a mixture of wool fat, petrolatum and paraffin, which the manufacturers claim will take up 300 per cent of water.—(Pharm. Ztg.)

Novatropine is said to consist of a combination of mandelic acid and methyltropine nitrate. It occurs in form of a white powder, melting at 162°, very soluble in water, less so in alcohol,

difficultly soluble in ether and chloroform. It is used for the same purpose as is atropine and homatropine.—(Ther. Halbmonat.)

Noventerol is an aluminium tannin egg-white combination containing 50 per cent tannic acid and 4 per cent earth salt, etc. —(Drug. Circ.)

Novofoment is an antiseptic glycerin- kaolin paste.—(Pharm. Zent.)

Novoterpene is a mixture of novocaine and oil of turpentine, dispensed in 0.5 mil ampuls, to be injected for furunculosis and infectious skin troubles.—(Pharm. Zent.)

Noxit, according to the Federal authorities, consisted essentially of opium, berberine, a zinc salt, glycerin, alcohol and water.—(J. Am. Med. Assoc.)

Nucleosan is an aphrodisiac medicine supplied in tablet form, each tablet representing 0.02 Gm. of yohimbine nucleinate.—(Am. Drug.)

Oetker's Albuminous Food contains lactalbumin and also calcium and phosphorus in organic combination.—(Pharm. Zent.)

Omeisan is a combination of sodium borate and sodium formate in crystalline form, designed for use as a lotion for wounds and for eczema.—(Pharm. Ztg.)

Opiall is a preparation of the hydrochlorides of all of the opium alkaloids.—(Pharm. Ztg.)

Optannin is a basic tannic acid calcium; $CaOH.C_{14}H_9O_9$ with 14.4 per cent calcium oxide and 85.6 per cent tannic acid.—(Drug Circ.)

Ormicet, according to O. Schmatolla, is a solution containing alkali formates, sodium sulphate and alum. Its analysis shows 0.44 per cent. of Al_2O_3, 3.5 per cent. of Na_2SO_4 and 1.9

per cent. of HCOOH. The paper gives details of the analysis as covered by the author.—Pharm. Ztg., 65 (1920), 778.

This preparation has been the subject of a lively controversy between Schmatolla, Rabe and Wolffenstein.—Pharm. Ztg., 65 (1920), 874, 908, 965 and 1018.

Ovaron consists of oblong tablets, containing cacao, sugar, peptonates of iron and manganese and glycogen. It is recommended in cases of mal-assimilation.—(Pharm. Ztg.)

Ovimbin consists of tablets containing 0.3 gramme of ovarian extract and 0.002 gramme of yohimbine hydrochloride.—(Pharm. Ztg.)

Ovobrol is a remedy for hysteria marketed as tablets, each containing 1 mil of ovoglandol and also sedobrol.—(Pharm. Zent.)

Oxymors is an odorless and tasteless powder made by treating basic aluminum acetate with benzoic acid. It is used as a vermifuge.—(Pharm. Zent.)

Pabst's Okay Specific, according to the Federal authorities, consisted essentially of volatile and fixed oils, plant extractives including cubebs, capaiba and buchu, and more than 29 per cent of alcohol.—(J. Am. Med. Assoc.)

Pageol contains balifostan and also the active ingredients of *Fabiana imbricata* and of *Histeromica bayalahuen.*—(Pharm. Zent.)

Pandigital is the name given by Crouzel to a digitalis preparation made by macerating 10 grammes of the finely chopped leaves with 950 mils of cold water (previously boiled) for 24 hours, filter, plug the funnel and pour 45 mils of 50 per cent alcohol over the residue on the filter. After six hours of contact, allow filtration to proceed and follow with the aqueous extract obtained in the first operation. To the combined liquids, add 5 mils of tincture of iodine and sufficient water to make

1000 mils. The tincture of iodine does not interfere with the therapeutic properties of the preparation; it is added to impart stability.—Rept. Pharm., through Pharm. Era, 53 (1920), 242.

Panflavine Pastilles for disinfection of the mouth and nasal passages, contain trypaflavine, an antiseptic dye stuff.—(Ph. Ztg.)

Panduglandine is an aqueous extract of the various animal glands as well as the liver, kidneys and other organs.—(Pharm. Ztg.)

Papier Fayard is similar to the product obtained by macerating 3 Gm. of euphorbium and 6 Gm. of cantharides with 32 Gm. of alcohol and adding to the tincture thus obtained 3 Gm. of turpentine. Paper is impregnated with this tincture.—(Am. Drug.)

Paraphthalein is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Parathesin is the trade name given by one manufacturer for ethyl paraminobenzoate anesthesia.—(J. Am. Med. Assoc.)

Parfaron is claimed by the manufacturers to be "a vulcanized high-molecular hydrocarbon in which benzyl benzoate and beta-naphthol is dissolved and in which is mixed a finely divided sulphate composition."—(Pharm. Ztg.)

Parry Medicines were fourteen in number and were numbered consecutively. They were essentially the same in composition, differing only in flavoring. Each was composed approximately of alcohol 25 per cent, water 25 per cent, and olive oil 50 per cent, to which was added a few drops of essential oils. No. 1 was for tuberculosis, lungs, bones or flesh, gallstones or Tapeworm. No. 2 was for cancers, adenoids, hemorrhoids, piles, asthma, goiter, typhoid and all other fevers. Extensive curative claims were similarly ascribed to the remaining twelve preparations. The Federal authorities have denied

the manufacturers the use of the mails.—J. Am. Med. Assoc., 75 (1920), 1732. (W. A. P.)

Pasacol is a mixture of colloidal inorganic bodies, marketed in tablets, each of which contains 0.025 Gm. calcium phosphate, 0.03 Gm. iron, 0.06 Gm. salicylic acid, 0.001 Gm. calcium fluoride and some albuminous protective colloid.—(Pharm. Zent.)

Pascossan is a remedy for rachitis and scrofula, containing calcium phospate and carbonate, iron lactate, oxide and peptonate and also silicic acid and iodine.—(Pharm. Ztg.)

Pasta Serosa is made from ox-blood and zinc and is used as a wound protective.—(Pharm. Zent.)

Pektosan Tablets contain extract of glycyrrhiza, pantopon, ipecac and sulphurated antimony.—D. A. Apoth. Ztg., 40 (1920), 158.

Perform is a form of saponated formaldehyde solution.—(Pharm. Ztg)

Perichol Tablets, each tablet is said to contain 0.1 Gm. catechol and 0.03 Gm. of papaverine, together with inert substances. —(Pharm. Ztg.)

Pernionin Tablets are to be dissolved in warm water and the solution then used as a foot lotion in frost-bite. They weigh 3 grammes and contain 1 per cent. oil of sage, 10 per cent. methyl salicylate and also hexamethylenamine.—(Pharm. Zent.)

Pertussiplast is a plaster of secret composition, recommended in whooping cough and pulmonary troubles.—(Pharm. Ztg.)

Phantosal Tablets were introduced as a preventive of influenza.—(Pharm. Ztg.)

Phenacaine is the hydrochloride of phenetidyl-acetphenetidine, a basic condensation product of paraphenetidine and acet-

paraphenetidine. Phenacaine was first introduced as holocaine hydrochloride. It is a local anesthetic like cocaine, but having the advantage of a quicker effect and an antiseptic action. Five minims of a one per cent. solution when in stilled into the eye are usually sufficient to cause anesthesia in from one to ten minutes.—(J. Am. Med. Assoc.)

Phenalein is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Phenobarbital formerly known as Luminal, is phenyl-ethyl-barbituric acid. It differs from barbitone (veronal) in that one ethyl group is replaced by one phenyl group. Used as a hypnotic; dose 0.2 to 0.3 Gm. (3 to 5 grains). Insoluble in water.—(Pract. Drug.)

Phenobarbital-Sodium is the monosodium salt of the preceding. Soluble in water. Dose, hypodermically, 0.1 to 0.3 Gm. (1½ to 5 grains) in 20 per cent. aqueous solution.—(Pract. Drug.)

Phenolax Wafers is a proprietary containing phenolphthalein. —(J. Am. Med. Assoc.)

Phenylmethylcarbinol—*Use as a Local Anesthetic.*—Hjort and Kaufmann find this substance an effective anesthetic; far better than its isomere, rose oil or benzylcarbinol.—Prescriber through Am. J. Pharm., 92 (1920), 683.

Phoroxyd is a highly saturated silver oxide protein preparation, which is obtained by the action of oxygen on silver salts. —(Pharm. Ztg.)

Phoskal is a veterinary nutritive salt containing phosphorus, manganese, lecithin and salts of iron and calcium.—(Pharm. Ztg.)

Phosphokodyl is a sterile solution, dispensed in ampuls, containing sodium cacodylate and sodium glycerophosphate.—(Pharm. Ztg.)

Phtisol Tablets are claimed to contain a "calcium-guaiacol-silicate compound" as well as aromatics.—(Pharm. Ztg.)

Phuphen is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Phyllogen is advertised as a "plant hematogen" and contains chlorophyll combined with mineral salts including iron.—(Pharm. Ztg.)

Pitralin is a liquid combination of Pitral (a colorless preparation obtained from pine-needle tar), together with several halogenized hydrocarbons. It possesses a light yellow color, has a pleasant aromatic odor and is said not to be inflammable. Hahneman reports considerable success in the treatment of trichophytosis.—(Munch Med. Wschr.)

Plantation Sarsaparilla, according to the Federal authorities, consisted essentially of potassium iodide, alcohol, plant material, sugar and water.—(J. Am. Med. Assoc.)

Platt's Chlorides.—The Council on Pharmacy and Chemistry reports that Platt's Chlorides is inadmissible to New and Non-official Remedies. The A. M. A. Chemical Laboratory analyzed a specimen purchased in 1911 and one purchased in 1919, and reports that while both contain aluminum salt and zinc chloride, they differ considerably in composition and the latter contains a very small amount of mercuric chloride. Whatever disinfecting or germicidal action the preparation may possess is exercised only when the solution is brought in direct contact with the substance to be disinfected. The aluminum and zinc salts present may be useful as deodorants, but they are not effective as germicides.—J. Am. Med. Assoc., 74 (1920), 903. (W. A. P.)

Pneumo-Phthysine, contains in 1000 parts 2.6 parts of guaiacol, 2.6 parts of formalin, 13.02 parts of creosote, 2.6 parts of quinine, 2.6 parts of methyl salicylate made into a cataplasm with glycerin and aluminum silicate.—(Pharm. Zent.)

Pollasthemol is a hay-fever remedy containing purin and quinine derivatives besides the borates of novocaine and suprarenin. It is applied as eye-drops.—(Pharm. Ztg.)

Poldy Cream is a new face cream.—(Pharm. Ztg.)

Poldy Duft Phiole is a pine needle distillate used in baths for nervous affections.—(Pharm. Ztg.)

Poldy Face Milk is an emulsion of almond and fats pleasantly perfumed.—(Pharm. Ztg.)

Polyacol is a mixture of the carbonic and cinnamic esters of mono-methylpyrocatechin and of potassium sulphoguaiacolate. —(Pharm. Zent.)

Polyfango is an improved form of *Fango* (See YEAR BOOK, 1918, 149), which when mixed with cold water becomes a poultice having the temperature of about 50° C.—Med. Klin., through Pharm. Zent., 61 (1920), 680.

Polyglandin is a solution of the autacoid principles of the thyroid, parathyroid, ovary, testes, and pituitary gland substances. Dose, hypodermically, 15 minims.—(Pract. Drug.)

Poral is marketed in the form of dragees containing colloidal sulphur, *bencinnozat*, *polyacol*, pulsatilla, drosera, sisymbrium, eucalyptus, convalleria and terpin hydrate. It is recommended for asthma and other pulmonary troubles.—(Pharm. Zent.)

Poschol is a catarrh snuff containing boric acid, cresol, sodium cresolinate, menthol and phenyl salicylate.—(Pharm. Ztg.)

Powerex is described as "a dried full cream milk with glycerophosphates."—(Pract. Drug.)

Prastux Bolus and Powder are veterinary remedies.—(Pharm. Ztg.)

Prescription 1000 sold in two forms; a copaiba preparation for internal use and a dilute permanganate solution for external use; has been the subject of prosecution under the Federal Food and Drug Act.—(J. Am. Med. Assoc.)

Probilin is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Proflavin Oleate is a paste containing the oleate of diaminoacridine mixed with liquid petrolatum and calcium carbonate.—(Pharm. Zent.)

Proganol is a compound of silver and albumose, containing not less than 8.3 per cent. of silver in organic combination. From 0.25 to 1 per cent. solutions are used in acute gonorrhea, and 5 to 10 per cent. instillations in chronic cases. In cystitis and urethritis from 1: 1,000 to 1: 2,000 solutions are used as irrigations. Used also in forms of bougies and tampons.—(J. Am. Med. Assoc.)

Prophylakticum is a venereal prophylactic containing the salicylates of silver and mercury.—(Pharm. Ztg.)

Prolaphten is a clear yellow fluid smelling of phenol, recommended for anthrax. It is said to contain "Tricynol pur., alum. kal. sulf. acid carbolic." Tricynol is a product put out by the firm marketing prolaphten.—(Pharm. Ztg.)

Promonta Nerve Food is a preparation, the composition of which is advertised as "producing an elevation of the vital and kinetic energy of the body cells."—(Pharm. Ztg.)

Prosthenase is a liquid containing iron, manganese and peptone.—(Pharm. Zent.)

Protosil is a scale protein silver preparation containing 20 per cent. of the metal.—(Pharm. Zent.)

Protura are a line of tinctures five times stronger than those of the German Pharmacopœia. Among them are concentrates

for bitter tincture and for tinctures of arnica, valerian and krameria.—(Pharm. Ztg.)

Prunoids is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Purgatol is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Purgella is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Purgen is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Purglets is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Purgo is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Purgolade is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Purgotin is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Purgylum is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Quella is a gargle containing salts from the Elizabeth spring at Bad Homburg.—(Pharm. Zent.)

Ramitol is a remedy for barber's itch and seems to be a solution of potassium permanganate.—(Pharm. Ztg.)

Redsules, according to the Federal authorities, consisted essentially of oil of santal, copaiba and methyl salicylate.—(J. Am. Med. Assoc.)

Regulol is a trade name for liquid petrolatum.—(Pharm. Zent.)

Reinhardtol is a solution of various aromatic substances in mixture of ether and alcohol. It contains 50 per cent. of alcohol. —(Pharm. Ztg.)

Rekonvalose is a combination of cereal extracts, milk proteids, nutritive salts and sodium glycerophosphate.—(Pharm. Zent.)

Renadesyn is an ointment containing adrenalin 0.02 per cent. and benzamime (eucaine) lactate 0.75 per cent.—(Pract. Drug.)

Renchol is a remedy for freckles and for various skin inflammations.—(Pharm. Ztg.)

Reneval is a veterinary tonic dispensed in 10 mil ampuls. The solution, which is to be administered subcutaneously, contains methyl disodium arsenate, glycerophosphates and strychnine.—(Pharm. Ztg.)

Repolax is a purgative containing phenolphthalein, synanthrose and fructose. It is marketed in the form of chocolate coated pastilles.—(Pharm. Ztg.)

Resophan is a compound of resin and sulphur marketed as a colloidal aqueous solution, and also in the form of ointment, bougies and dusting powder. It is used as an antiseptic.—(Pharm. Ztg.)

Resopon, a sulphuretted rosin compound, used for the treatment of wounds, fistula, either in form of an alcoholic solution or as a 5 per cent. petrolatum ointment.—(Am. Drug.)

Resorthan is a preparation containing resorcin, thymol iodide and extracts of belladonna and hyoscyamus.—(Pharm. Zent.)

Rheuma-Mattan is a yellow-brown salve of resinous odor, said to contain glyceryl salicylate or *saglyn*, petrolatum and soap. It is used in rheumatism.—(Pharm. Ztg.)

Rheumamenthol represents a combination of menthol, methyl salicylate, salicylic acid, allyl isothiocyanate, capsicum and camphor. It is employed in gouty and rheumatic affections.—(Pharm. Ztg.)

Rheuman is a liniment consisting of menthol, salicylic acid, capsicum and methyl salicylate.—(Pharm. Zent.)

Rheumulzin is a rheumatic ointment containing salicylic acid, menthol and oil of turpentine.—(Pharm. Ztg.)

Rhino-Fogyl is an ointment containing meta-oxyphenol, malicyl, menthol, eucalyptol and colloidal sulphur.—(Pharm. Zent.)

Rid-It Caps, according to the Federal authorities, consisted essentially of salol, oils of juniper and sassafras, turpentine, a fixed oil and coloring matter.—(J. Am. Med. Assoc.)

Riodine is a solution in oil (66 per cent.) of an iodine addition product of castor oil. It contains about 17 per cent. of iodine, and is given as other fatty iodine compounds in doses of 0.4 to 1.2 Gm. (6 to 18 grains), in capsules (0.2 Gm.) after meals.—(Pract. Drug.)

"R. M. G." is a rheumatic ointment; the composition of which has not been published.—(Pharm. Ztg.)

Robursan is an elixir containing cinchona, kola, peptone, soluble phosphates and Malaga wine.—(Pharm. Ztg.)

Romanyl is marketed as a liquid and as tablets. Both of these forms contain pulsatilla, lobelia, drosera, grindelia, sisymbrium and *benzinnosat.*—(Pharm. Zent.)

Rubio is an extract of carrots, recommended in anemia of childhood and in rickets.—(Pharm. Ztg.)

Russolax is a trade name for a refined liquid petroleum for internal use.—(Pract. Drug.)

Sabin's Indian Vegetable Cough Balsam, according to the Federal authorities, consists essentially of alcohol, chloroform, tar, resin, sugar and traces of alkaloids.—(J. Am. Med. Assoc.)

Sabin's Indian Vegetable Tea, according to the Federal authorities has a composition similar to Green Mountain Herb Tea.—(J. Am. Med. Assoc.)

Salicarin is the glucoside extracted from the purple loosestrife (*Lythrum salicaria*), a liquid extract of which plant has been found useful in diarrhea. Salicarin is given in solution or in tablets, in doses of 0.1 to 0.5 Gm., and is said by Caille to give the full therapeutic effects of the drug.—(Pract. Drug.)

Salifson is a superfatted aromatic salicylic acid saponaceous cream.—(Pharm. Zent.)

Salimbin is a preparation containing salipyrine and yohimbine hydrochloride. It is used for dysmenorrhea.—(Pharm. Ztg.)

Sal Sano, according to the Federal authorities, consisted essentially of sodium chloride, sodium phosphate, sodium bicarbonate and sodium sulphate.—(J. Am. Med. Assoc.)

Samosit is a nutritive, which, according to the manufacturers, contains 20 per cent. of oil-free cacao, 5 per cent. of powdered egg albumin, 5 per cent. of milk powder, 10 per cent. of calcium phosphate, 10 per cent. of sugar of milk, 5 per cent. of malt and also iron.—(Pharm. Ztg.)

Sanaperin is acetylsalicylic acid colored with quinoline yellow.—(Pract. Drug.)

Sanger's Capsules, according to the Federal authorities, consisted essentially of copaiba, cubebs, santal oil, matico, licorice root and magnesium oxide.—(J. Am. Med. Assoc.)

Sanivalen is a lecithin preparation containing 12.5 per cent. of lecithin protein.—(Pharm. Ztg.)

Sano Pastilles contain methylene diguaiacol acetyl ester.—(Pharm. Ztg.)

Sarnol is a wash for skin eruptions.—(Pharm. Ztg.)

Satyrin is an aphrodisiac consisting of tablets containing yohimbine hydrochloride, dried testes, iron salts, lecithin and dried ovaries.—(Pharm. Ztg.)

Saurol is a sulphur containing oil distilled from a shale found in Switzerland. It is advanced as a substitute for ichthyol.—(Pract. Drug.)

Scabolen is a new skin lotion, the composition of which has not been published.—(Pharm. Ztg.)

Sealeaf Emulsion, according to the Federal authorities, is an emulsion of cod liver oil and malt extract.—(J. Am. Med. Assoc.)

Secalopan is a preparation, in extract form, prepared by "Ciba" in Basel. Uhlmann and Mirmelstein have subjected the preparation to exhaustive experimentation and conclude that it contains all active substances found in ergot and that as far as action is concerned, the extract compared to the drug as 2 to 1. The investigators claim to have subjected 15 preparations made from ergot, including secalopan, to a most searching examination, and that the latter yielded the most consistent results.—(Z. exp. Path. Therap.)

Seeley's Nervena, according to the Federal authorities, is a syrup containing alcohol and vegetable extractives, among which are those of juniper, wild cherry, senna, gentian, sassafras, uva ursi and cinchona.—(J. Am. Med. Assoc.)

Sej is a tonic food containing iron saccharate, yeast, albumin and phosphates.—(Pharm. Ztg.)

Sempercitin is a preparation like *sanizalen*, containing 25 per cent. of lecithin.—(Pharm. Ztg.)

Semprolia is a special brand of white petrolatum.—(Pharm. Zent.)

Senegalit is a compound extract of senega.—(Pharm. Ztg.)

Sepedon is tooth paste for hardening the gums. The manufacturer also markets as sepedon tooth wash.—(Pharm. Ztg.)

Short Stop, according to the Federal authorities, is a syrup containing licorice and wild cherry extracts, ammonium carbonate, a small amount of an antimony salt, benzoic acid, camphor, oil of anise, and traces of an alkaloid.—(J. Am. Med. Assoc.)

Siccostypt is fluid extract of shepherd's purse, recommended as a substitute for ergot and hydrastis.—(Pharm. Zent.)

Siggin is the name given a rheumatic remedy.—(Pharm. Ztg.)

Silicol Tablets contain in each tablet, 0.1 Gm. colloidal silicic acid. It is used in tuberculosis.—(Pharm. Zent.)

Silicium Vegetabile is a dialysate from a mixture of 75 parts of equisetum, 150 parts of polygonum and 50 parts of galeopsis. —(Pharm. Zent.)

Silver Silvarsan is now on the market after extended experimental work in hospitals. It is a brownish-black powder that is soluble in water.—(Pharm. Ztg.)

Sinegripp is a prophylactic against influenza.. It is an oily fluid smelling of fennel, which is dropped upon a pledget of cotton and after insertion in a holder is "smoked" like a cigarette. —(Pharm. Ztg.)

Singleton's Eye Ointment was found in 1909 by the chemists of the British Medical Association to be principally a mixture of lard and Japan wax and purified coconut oil, with 4 per cent. of beeswax and 7.4 per cent. of red mercuric oxide.—(J. Am. Med. Assoc.)

Sinuberase is a remedy for dyspepsia and enteritis marketed in tablet form. It contains the various species of lacto-bacilli.—(Pharm. Zent.)

Siran.—This preparation according to A. Jermstad consists of 1.094 per cent. of potassium sulphoguaiacolate, 0.705 per cent. of ammonium benzoate, 0.631 per cent. of ammonium chloride, 18.245 per cent. of sugar and also peppermint oil, a synthetic sweetening agent and a red dye.—Schweiz Apoth. Ztg., 58 (1920), 361.

Skabiol, according to Evers, is an 11 per cent. soap solution containing 1.55 per cent. of benzyl benzoate. It is recommended in cases of skin irritation.—(Pharm. Ztg.)

Skeen's Stricture Cure, according to the Federal authorities, consisted essentially of a solution of ferric chloride in alcohol in water.—(J. Am. Med. Assoc.)

Soarsan is an arsenical anti-syphilitic.—(Pharm. Era.)

Sodium Arsphenamine or sodium arsenphenolamine is the sodium salt of 3-diamino-4-dihydroxyl-1-arsenobenzene with a stabilizing medium. The arsenic content of three parts of sodium arsphenamine is equivalent to two parts of arsphenamine. Sodium arsphenamine has the same actions and uses as those of arsphenamine; its advantage over arsphenamine is that it does not require addition of alkali before use. To prepare the solution the sodium arsphenamine is added to the required amount of sterile water and dissolved by gentle agitation—(J. Am. Med. Assoc.)

Sodium Diarsenol is a brand of sodium arsphenamine that is marketed in ampuls containing 0.15 Gm., 0.45 Gm., 0.6 Gm., 0.75 Gm., and 0.9 Gm., respectively.—(J. Am. Med. Assoc.)

Solagen is a sterile neutral one per cent. sodium arsenate solution.—(Pharm. Zent.)

Solquinate is the trade name of a brand of oxy-quinoline sulphate, a non-poisonous antiseptic known also as superol and chinosol.—(Pract. Drug.)

Sorbat is a gall-stone remedy of secret composition.—(Pharm. Ztg.)

Sparachir is a water-proof bandage made of cellulose.—(Pharm. Zent.)

Spasmalgine (Roche) is described as a combination of papaverine, omnopon, and atrinal. It is given in gastric pain, colic, and painful menstruation, being supplied in the form of tablets and solution for hypodermic injection.—(Pract. Drug.)

Spasmodin is a trade name given to physiologically pure benzyl benzoate.—(Pract. Drug.)

Specifique Bejean, each 100 grammes of the product contain 2 Gm. of Gaiacin, 5 Gm. of potassium iodide, 3 Gm. of extract of juniper berries, 15 Gm. of alcohol and 75 Gm. of distilled water. To this mixture is added 3 drops of methyl salicylate. It is employed in gouty affections.—(Pharm. Zent.)

Spirigon is a venereal prophylactic consisting of a ten per cent. glycerinic solution of protein silver and a salve containing isoethylhydrocupreine.—(Pharm. Ztg.)

Spuman consists of cylindrical pastilles containing such medicaments as tannin, protargol or ichthyol, which when inserted into the urethra or other orifices of the body produces an antiseptic froth.——Berl. Klin. Wsch., through Pharm. Zent., 61 (1920), 745.

Stannoxyl.—On the assumption that tin workers were less troubled with boils than the average person, two French investigators proposed the use of tin compounds in the treatment of staphylococcus infections. Based on their work, a proprietary preparation—Stannoxyl—has been placed on the market with

the claim that it is "composed of stannous oxide and specially purified metallic tin." Extravagant and unwarranted claims are made for the product.—(J. Am. Med. Assoc.)

Stohal is an absorbent charcoal prepared from turf. Remarkable qualities (including radioactivity) are ascribed to it by its manufacturer. A diversified line of preparations are made from it.—(Pharm. Zent.)

Styphyralum-Liquidum is a hemostatic fluid prepared from shepherd's purse.—(Pharm. Ztg.)

Sthenochrisma is an ointment containing lecithin extract. It is used to relieve neuritic pains.—(Pharm. Ztg.)

Styrolin is a substitute for storax and balsam of Peru and is a solution of resins in aromatic esters. In cases of itch, a mixture of equal parts of styrolin and alcohol is used.—(D.-A. Apoth. Ztg.)

Sukro-Serum and Aplegmatol are proprietary preparations based on the "sugar cure" of Lo Monaco. Sukro-Serum is advertised as a "sterilized solution of lacto-gluco-saccharose" but apparently it is a solution of ordinary sugar (sucrose). Aphelegmatol was found to contain a reducing substance probably glucose, amounting to about 7.4 per cent. After hydrolysis 55.5 per cent. of glucose was found.—(J. Am. Med. Assoc.)

Sulfnutrinol are tablets containing the sulphates of magnesium, sodium and potassium, as well as vegetable purgatives.—(Pharm. Zent.)

Sulfoxylat is a water-soluble salvarsan preparation. Ordinary salvarsan oxidizes very quickly on contact with air, and is thereby easily converted into a poisonous substance. Sulfoxylat will not do so on 24 hours contact with air; its solution will act likewise.—(Drug. Circ.)

Supsalvs, according to the manufacturers, are "stable suppositories of '606' (of French manufacture)" with the claim

that by rectal administration of these suppositories the effects of arsphenamine may be obtained. The Council found Supsalvs inadmissible to New and Nonofficial Remedies, first, because the quality of the medicament contained in the suppositories has not been established and, second, because the claimed efficacy of this preparation as a means of securing the effects of arsphenamine lacks substantiating proof.—(J. Am. Med. Assoc.)

Sycosan is a perfumed brown salve used in psoriasis alopecia and other skin troubles.—(Pharm. Ztg.)

Syrup Leptinol, which was formerly called Syrup Balsamea is a balsamic syrup made from an unclassified species of Leptotænia (a plant belonging to the parsnip family) which grows in Nevada. It was not admitted into New and Nonofficial Remedies since no evidence was presented to show that it had the remarkable properties ascribed to it by the Balsamea Company. The clinical reports which were reported were little more than chance observations and lacked all control.—(J. Am. Med. Assoc.)

Tabalax is the name given purgative tablets containing phenolphthalein.—(Pharm. Ztg,)

Taformal Cream is a compound of tannin and formaldehyde recommended in excessive perspiration.—(Pharm. Ztg.)

Talan Tablets contain in each tablet 0.1 Gm. phenolphthalein, 0.5 Gm. sugar, 0.0005 Gm. menthol, 0.002 Gm. vanillin and 0.1 Gm. sugar of milk.—(Pharm. Ztg.)

Tampofirm is a tubular gauze containing compressed absorbent cotton, designed to use as a tampon.—(Pharm. Zent.)

Tampospuman is a hemostatic recommended by Esser as of particular value in excessive menstruation.—Therap. Gegenw., through Pharm. Zent., 61 (1920), 610.

Tannin Albuminate was first introduced as tannalbin. It is a compound of tannic acid and albumin, thoroughly exsiccated and containing about 50 per cent. tannic acid in combination. It is a light brown, odorless, tasteless powder, practically insoluble in water or alcohol, but slowly soluble in alkaline fluids which decompose it. It is supplied in powder form and as tablets tannin albuminate exsiccated-Merck, 5 grains. The preparation is used in diarrheas on the assumption that it passes the stomach largely unchanged and exercises the action of tannic acid in the intestines.—(Pract. Drug.)

Tarbocil is a diuretic containing potassium borotartrate and scillain, marketed in the form of tablets.—(Pharm. Zent.)

Tartrostibias Anilini are needles containing a compound of tartaric acid, aniline and antimony trioxide. It is used subcutaneously in trypanosomatous conditions.—(Chem. Abs.)

Tebelon is a very peculiar remedy as is well known. The tubercular bacillus contains a large percentage of wax (up to 40 per cent.), on which partly rests its great ability to withstand antiseptic or bactericide substances. Stoltzner had an idea that he could destroy the tubercular bacilli with substances that dissolve in wax but did not come to a positive result. It appears that waxy bodies exert a favorable influence over all bacilli except tubercular when correctly applied. Stoltzner as a result of his investigations came to the following conclusions: on contact with injected wax, bandage-fabric will react with the formation of wax antibodies or waxy ferments; the greater the contact surface between the bandage fabric and wax the finer the wax is divided under the skin. The anti-bodies belong with the lymphatics in the general circulation and attack the tubercular bacilli. Isobutylester of oleic acid has proved to be the best of a large number of wax-like substances. Stoltzner named it tebelon.—(Drug. Circ.)

Teboel Preparations include lotion for headache and for frost bite, a mouth wash and a hair tonic.—(Pharm. Ztg.)

Temagin is a cake containing tar, intended to replace tar soap.—(Pharm. Ztg.)

Terpichin is a fluid for injection containing oil of turpentine (15%) quinine, anesthesin and olive oil. It is used in skin troubles and in urinary inflammations.—(Pharm. Ztg.)

Terogon is a remedy for gonorrhea in the form of tablets, containing 75 per cent. of extract of pichi, 14.5 per cent. of extract of kava-kava, 5 per cent. of lecithin and 0.01 per cent. of volatile oil of chamomile.—(Pharm. Ztg.)

Testimbin is an aphrodisiac containing testicular extract and yohimbine hydrochloride.—(Pharm. Ztg.)

Testochithin is a mixture of the ingredients of the testes and the hypophysis with lecithin from the yolk of egg. It is recommended for neurasthenia, etc.—(Pharm. Ztg.)

Tetrahydroatophan is a crystalline substance obtained by reducing phenylquinoline carbonic acid. It is used for the treatment of spinal diseases.—(Pharm. Weekbl.)

Thalosen is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Theacylon is an aspirin derivative of theobromine. It has no action in the stomach and decomposes in the intestines, forming aspirin and theobromine.—(Am. Drug.)

Thiarfeine is a trade name for caffeine thiocinnamate.—(Pharm. Zent.)

Thigenol is a sodium salt of a sulphonated bituminous body resembling ichthyol. F. Kuhn recommends it in furunculosis.—(Pharm. Zent.)

Thaspan is a dialysate of *Capsella bursa-pastoris*. It is recommended by Walther as a hemostatic of as great value as ergot preparations.—(Pharm. Ztg.)

Three Days Cure, according to the Federal authorities, consisted essentially of zinc sulphate, boric acid and water.—(J. Am. Med. Assoc.)

Thromboplastin Hypodermic is a sterilized extract of cattle brain in physiological solution of sodium chloride. It complies with the description of thromboplastin, but a longer time is required for the clotting of blood plasma. It is intended for hypodermic and intramuscular injection to increase the coagulability of the blood.—(J. Am. Med. Assoc.)

Trophleol is a 50 per cent. solution of erythrophleine hydrochloride (the alkaloid of sassy bark) in eugenol. It is claimed to devitalize a dental pulp in 36 hours without pain.—(Chem. Abs.)

Thymol Palmitate is recommended by Munk in trichinosis.—(Pharm. Ztg.)

Thyreoglobulin Tablets contain an extract of the thyroid glands containing iodine in protein combination.—(Pharm. Ztg.)

Thyroxin is 4,5,6-trihydro-4,5,6-triiodo-*alpha*-oxy-*beta*-indole propionic acid $(C_8H_3ONI_3).C_2H_4.COOH$; an active principle obtained from the thyroid gland. It contains 65.1 per cent. iodine. Is used essentially for the same purposes as Dried Thyroids, U. S. P. It is indicated in cases of diminishing or absent thyroid functioning such as simple goitre, cretinism and myxedema. Occurs as white crystalline needles in the pure form. It is insoluble in water and the usual organic solvents. It melts at 250° C. It is very susceptible to reduction, being easily decomposed by zinc in alkaline solution.—(Pract. Drug.)

Tiargirio is the name given by Paolini to a new antiseptic for the treatment of wounds. It is described as dithio-salicylate of mercury, $C_{14}H_8O_6S_2Hg_2$, and contains 53.75 per cent. of mercury, 8.60 per cent. of sulphur, and 37.65 per cent. of salicylic acid. It occurs as a brownish-yellow powder, insoluble in water, alcohol, and ether. It is decomposed on heating. A 3 per cent. ointment, prepared with vaseline, has been found useful in the treatment of eczema and psoriasis.—(Chem. & Drug.)

Tiocose-Piam is an Italian substitute for guajacose.—(Pharm. Zent.)

Tisit, according to the Federal authorities, consisted essentially of an aqueous solution of zinc sulphate, thymol, alum and glycerin.—(J. Am. Med. Assoc.)

Tisit Pearls, according to the Federal authorities, consisted essentially of a mixture of oil sandalwood, balsam and copaiba, oil of cinnamon and a fixed oil.—(J. Am. Med. Assoc.)

Tonerdal Salve is an emulsified ointment base containing 40 per cent. of a basic aluminum acetate. **Unguentum tonerdale composition** is this base admixed with 2 per cent. of salicylic acid and 20 per cent. of freshly precipitated sulphur.—(Pharm. Ztg.)

Toramin is malonic acid trichlorbutylester and is on the market in the form of its ammonia salt. It is soluble in water and is used as a cough remedy.—(Drug. Circ.)

Totin is lice exterminator of secret composition.—(Pharm. Ztg.)

Transannon is a remedy for use during the climacteric, consisting of "pearls" containing calcium and magnesium salts, in ichthyol preparation and vegetable purgatives.—(Pharm. Ztg.)

Tricalcol is a colloidal tricalcium phosphate and egg-white combination, that is, a mixture of 20 per cent. tricalcium phosphate with 80 per cent. casein.—(Drug. Circ.)

Trypaflavine is an antiseptic taken from among the dyes. It is the chloride of 3-6 diamido, 10-methylacridinium. A methyl derivative, combined with the nitrate of silver, is known under the name of "septacrol" and has been used in treatment of the grippe by intravenous injections.—(Am. Drug.)

Tubb's Bilious Man's Friend is a hydro-alcohol solution of sugar and plant extractives, notably rhubarb. It has been declared misbranded under the Federal Food and Drugs Act.—(J. Am. Med. Assoc.)

Tussiflorine is an extract containing the active constituents of polygala, sanicula, mint, farfara, licorice, hieraceum and milfoil combined with syrup.—(Pharm. Ztg.)

Tussylsan is a whooping-cough remedy containing juniper and thyme.—(Pharm. Ztg.)

Tutor is a silver protein preparation recommended as a venereal prophylactic.—(Pharm. Ztg.)

Ultroid Manganese is a colloidal suspension of manganese hydrate, 1 in 200, for hypodermic use.—(Pract. Drug.)

Uracol is a nutritive tonic marketed in the form of roundish, grayish tablets. It is said to contain iron and calcium phosphate. —(Pharm. Ztg.)

Uricil is a liniment containing balsams and chloroform. It is recommended for rheumatism.—(Pharm. Ztg.)

Urkraft is protein nutrient containing, according to its manufacturer, 80 per cent. of lactalbumin. Utz found it to contain 7.46 per cent. of water; 4.12 per cent. of mineral salts, notably phosphates and lime; 3.82 per cent. of fat; 19.99 per cent. of soluble carbohydrates; no insoluble carbohydrates; 60.38 per cent. of protein matter and 4.23 per cent. of glycerin.—(Pharm. Zent., 61 (1920), 630.

Urocedrol is a gonorrhea remedy containing the volatile oil of *Cedrus Atlantica,* urotropin, camphoric acid and salol. It is marketed in gluten-coated enteric capsules.

Uropurin Tablets are a series of tablet medicaments, each with a basis of uva ursi. Of the series, one also contains salol, another, hexamethylenamine, etc.—(Pharm. Zent.)

Vakzigon is the name given to a vaccine for gonorrhea made in Germany.—(Pract. Drug.)

Valeriopan is a preparation claiming to contain all of the active principles of valerian.—(Pharm. Zent.)

Valerobromine, a French preparation containing sodium valerate and sodium bromide; marketed in the form of an elixir and in keratin coated capsules. In the latter the sodium salt is replaced by the magnesium salt.—(Am. Drug.)

Valifluid, a fluidextract of valerian. Each tablespoonful corresponds to 10 grammes of tincture of valerian.—(Am. Drug.)

Valimbin is a remedy for chlorosis and anemia containing the valerates of the yohimbine bases.—(Pharm. Ztg.)

Valodragine are lozenges which contain 0.1 gramme quinine valerate, 0.3 gramme camphor monobromide and extract of valerian.—(Am. Drug.)

Vargol is a compound of silver and a derived albumin containing not less than 20 per cent. of silver.—(J. Amer. Med. Assoc.)

Vasoglyal is a secret remedy for frost bite.—(Pharm. Ztg.)

Venarsen, a sterile solution of organic arsenic and metallic mercury for use in syphilis by intravenous injection.—(Am. Drug.)

Veracolate is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Vermal are worm lozenges containing 10 per cent. of extract of tansy, 1 per cent. of areca nut and 87 per cent. of parsley root —(Pharm. Ztg.)

Vermifugin is a worm remedy consisting of two kinds of tablets for internal use, one form to be dissolved and used as an enema; the other, a rectal salve.—(Pharm. Ztg.)

Verodigen is a proprietary form of gitalin.—Pharm. Zent., 61 (1920), 305.

Veronidia contains veronal and plant extracts, notably that of Passiflora incarnata. It is marketed in liquid and tablet form. —(Pharm. Zent.)

Vertigoin is a radium preparation recommended for fainting spells and sea-sickness.—(Pharm. Ztg.)

Vethormon is a veterinary aphrodisiac.—(Pharm. Ztg.)

Veto Tablets, formerly called **Virginal tablets** contain sodium perborate, sodium bicarbonate, organic acids, boric acid, paraformaldehyde, etc. They are used as preservatives and antiseptics.—(Pharm. Ztg.)

Vigor Sirup is a compound syrup of glycerophosphates, recommended in anemia, rickets and scrofula.—(Pharm. Ztg.)

Viscalbine Baljet is a standardized hypotonic fluid containing the resin-free constituents of fresh *Viscum album*.—(Pharm. Ztg.)

Vitanol is a liquid tonic containing ferric and calcium glycerophosphates.—(Pharm. Zent.)

Vitmar is a food product, said to contain the vitamines—fat-soluble A (growth promoting); water-soluble B (antiscorbutic). —(Pract. Drug.)

Vulnoplast is a special form of adhesive wound bandage.—(Pharm. Ztg.)

Walmosa is a freckle remedy.—(Pharm. Ztg.)

Wehalax is marketed as pills containing extract of rhubarb, aloes, belladonna, podophyllin and jalap.—(Pharm. Zent.)

White Swan Injection, according to the Federal authorities, consisted essentially of an aqueous solution of boric acid, salts of aluminum, zinc and ammonium, glycerin and phenol, with bismuth subgallate in suspension.—(J. Am. Med. Assoc.)

Wilson's Solution Anti-Flu, according to the Federal authorities, consisted essentially of oil of eucalyptus, methyl salicylate, thymol or oil of thyme.—(J. Am. Med. Assoc.)

Wurmserol-Merz is a vermifuge marketed in a collapsible tube provided with a detachable rectal pipe. It consists of novocaine, alsol and chinosol admixed with a patented water-soluble ointment mass.—(Pharm. Ztg.)

Yeast is being exploited by a large compressed yeast firm, as remedy for boils, constipation, pimples and malnutrition.

Zaegel's Essence has been analyzed by the Federal authorities, who found it to consist essentially of alcohol, water, sugar and plant extractives, including laxative substance and a saponin.—(J. Am. Med. Assoc.)

Zaegel's Lung Balsam, according to the Federal authorities, consisted essentially of alcohol, water, sugar and a laxative plant material flavored with oil of peppermint.—(J. Am. Med. Assoc.)

Zam Zam is a proprietary containing phenolphthalein.—(J. Am. Med. Assoc.)

Zefergan Tablets are brown pastilles of pleasant taste, said to contain lecithin, iron and calcium phosphate; nutritive salts and aromatized sugar. They are used as a nutritive tonic.—(Pharm. Ztg.)

Zeman is a veterinary preparation resembling prolaphten.—(Pharm. Ztg.)

Zinkenol is a plastic mass containing zinc oxide, "salicyl," eugenol, isoeugenol and benzoyl acetate, intended as a filler for dental cavities.—(Pharm. Ztg.)

Zittmannin is a trade name for 3-gramme tablets containing the ingredients for preparing compound decoction of sarsaparilla. —(Pharm. Ztg.)

Zymoidine, a prophylactic ointment, consisting of a mixture of zinc oxide, aluminum oxide, bismuth oxide, iodine, boric acid, phenol, gallic acid, salicylic acid and quinine, equal parts of each, to make a 25 per cent. ointment.—(Am. Drug.)

MATERIA MEDICA

A—GENERAL SUBJECTS

DRUG PLANT CULTIVATION

Drug Plant Cultivation.—*In Great Britain.*—E. M. Holmes discusses the cultivation of medicinal plants in other parts of the world and in England.

The Hungarian government has placed the medicinal herb industry under state control. The United States have exported *Cannabis Indica* of excellent medicinal value to England and are supplying henbane, belladonna and digitalis to South Africa and Australia. Many American drugs can be grown readily in England. Among the almost unobtainable drug products of Russia are birch-tar oil *(Oleum Rusci)* which could be obtained easily and cheaply from birch forests of Scotland; ergot, abundant in many rye fields and easily separated from the grain at the time of threshing; and santonin, obtainable from *Artemisia Gallica* var. *maritima,* which would probably do well in the salt marshes of Kent, where *Artemisia Gallica* flourishes. Many other drug and perfume plants and culinary herbs could be raised here in addition to those now profitably cultivated. The necessity of purity and quality and of Government inspection was indicated.—Chem. & Drug. 92 (1920), 421, through Bot. Abstracts. (E. N. G.)

Medicinal Plant Cultivation.—*In Germany.*—Hanns Fischer deplores the fact that the gathering and cultivation of medicinal

plants in Germany has been so thoroughly neglected since the advent of the World War. Not only is there little interest in this industry at present but the fact that every able bodied citizen is required in the work of reconstruction and labor is high, makes it quite unlikely that the industry will be greatly stimulated in the near future. Fischer fears the necessity for depending upon foreign sources for medicinal plants and suggests that disabled war veterans, and others who have time on their hands be educated to identify and properly collect the medicinal plants which are native to their particular locality. In that way a beginning will be made for the restoration of this important industry. He suggests using the government bulletins which indicate the habitat of various drugs, in this connection, and asks the pharmacist to be prepared to instruct those who may be induced to take up medicinal plant collection and cultivation as a side line.—Pharm. Zent., 61 (1920), 279. (R. B. F.)

Drug Plant Cultivation.—*In the United States.*—W. O. Richtmann draws attention to the fact that the subject of the cultivation of the plants from which crude vegetable drugs are obtained can be traced to the days of the Colonial settlers, who brought over with them and propagated in new surroundings plants that were familiar to them on European soil. One record published in 1769 by John Ellis, an agent for West Florida, listed eighty-two different plants; thirty-seven of these yield official products of the U. S. P. IX; four are official in the last N. F. In 1770 Ellis published "Directions for Bringing Over Seeds and Plants from the East Indies and Distant Countries in a State of Vegetation"; this is a forerunner of our present seed and plant introduction work of the U. S. Department of Agriculture. Some of the foreign plants that were cultivated successfully in the early days of our history are: oranges, indigo, sesame, Spanish saffron, and opium poppy. As early as 1784, strong appeals were made to cultivate native plants for the trade, particularly ginseng. From that time until 1901 the botanists of the U. S. Department of Agriculture have made appeals from time to time to encourage the growth and protection of native plants useful for medicine. Today the office of Drug

Plant Investigations, established in 1901, is working out a broad, comprehensive plan to study the identity, distribution, propagation, cultivation, breeding, selecting etc., of a large number of our individual plants which are useful from a medicinal point of view. Co-operating with the Government in this important work are a number of schools of pharmacy, a number of firms and corporations interested in the cultivation of crude vegetable drugs from a commercial point of view, and many individuals who are doing various phases of the work; all combining their efforts to show that it is worth while to cultivate these medicinal plants if we only take a chance.—J. Am. Pharm. Assoc., 9 (1920), 816. (M. O'C. D.)

Drug Plants.—*Collection in England.*—In consequence of the shortage during the war of medicinal herbs, an association of women in Suffolk started the systematic collection of such plants. From 1916 to 1918 belladonna, henbane, and foxglove were the chief herbs handled. Last year the demand for these fell off, but in their place arose a request for sweet-smelling herbs and flowers, and it is reported that during the current year collections thereof for the perfumery trade are being organized throughout the county of Suffolk. The new scheme is under the supervision of women botanical experts. It is stated that this rural industry has already resulted in considerable pecuniary benefit to East Anglian villagers, who have been instructed in the proper method of collecting.

A mill at Blackenham purchases the collections and prepares them for the market. The prices per pound at the mill for such dried flowers are: Cowslips (heads only), 2 cents; broom flowers, 8 cents; elder-heads, 1 cent, with florets picked off, 5 cents; lime, 6 cents; mullein and mallow, 8 cents; bergamot (flowers without calyx), 12 cents; lavender—on stalks, 12 cents, rubbed off stalks, 61 cents; dark-red peony petals, 10 cents; dark-red rose petals, 6 cents; red field poppy petals, 8 cents; mullein leaves, 2 cents; raspberry leaves, 1 cent; sage, mint, balm, agrimony, and woodruff (whole herbs), 2 cents. Thyme brings 36 cents per 14 pounds.—Comm. Rept., through Pharm. Era, 53 (1920), 164.

Drug Plants.—*Selective Breeding of.*—W. G. Smith states that while agricultural plant-breeding is largely done by public bodies with the results published, experiments in medicinal plant-breeding are mostly by private cultivators, who naturally keep to themselves valuable information regarding improved production or quality. Cultivation, manuring and treatment may produce larger plants, but rarely change internal qualities such as the nature and yield of active principles. Increased yield or improved quality of active principles is brought about by the constant selection of the best individual plants in these respects and the production of pure lines from them. Hybridization, yielding new combinations, extends the range of possible improvement in any required direction. Many illustrations are cited, particularly, the great improvement made in recent years in French lavender with the development of *Lavendula vera fragrans* and *L. v. delphiniensis;* and the increased yield and improved quality of Hungarian mint oils from *Mentha crispa* and *M. piperita;* and the greatly enriched strains of American grown belladonna, stramonium and hyoscyamus.—Pharm. J., 104 (1920), 116, through Bot. Abstracts. (E. N. G.)

Phytochemical Research.—*New Results from.*—At the Philadelphia meeting of the American Chemical Society, E. Kremers reported upon some interesting facts connected with the drug plant cultivation done at the University of Wisconsin. Among the topics discussed were: the increase in ash content of digitalis with increase in the fineness of the powder; the irritating vapors given off, when finely powdered hyoscyamus was ashed, due, most likely, to principles found in the abundant leaf hairs; and lastly certain problems connected with the distillation of volatile oils from plants.—J. Ind. Eng. Chem., 12 (1920), 1018.

BACTERIOLOGY

Bacteriology.—*Biological Therapy.*—An informal discussion of bacteriology and biological therapy presents interesting information on the following: pollen extracts; the Wassermann test; the luetin test; the agglutination reaction; lactic acid products; veterinary serums and bacterins; anthrax; black leg;

equine influenza; hermorrhagic septicemia; white scours.—Bull. Pharm., 34 (1920), 30. (C. M. S.)

Diphtheria Bacilli.—*New Culture Medium for.*—K. Klein found that Loeffler's culture medium might well be replaced by one prepared by heating 9 parts of horse serum with 1 part of 15 per cent. caustic soda solution for two days at 37°, then neutralizing the mixture with hydrochloric acid, adding 4 parts of agar and sterilizing the mixture for one half hour at 105°. This preparation is completely sterile, transparent and limpid and permanent for a comparatively long time.—Dtsch. Med. Wsch., through Pharm. Weekbl., 57 (1920), 1112. (H. E.)

Diphtheria Toxins.—*Action of Colloidal Metals on.*—Le Fèvre de Arric finds that while colloidal silver, gold and platinum have no action on diphtheria toxins, colloidal iron and notably colloidal manganese have distinct action, the manganese colloid markedly reducing the toxic action of the diphtheria bacteria.—J. Pharm. Chem., 21 (1920), 70.

Diphtheria Bacilli.—*Rapid Detection of.*—Debré and Letulle write on the differential importance of Babes' polar granules, shown up by double staining, in true diphtheria bacilli. Two years experience with this method of differentiation has convinced them of its precision and reliability. The pseudo-diphtheria bacilli never show granulations at the poles when stained by the technic described, which is a modification of Neisser's first method. The specimen is incubated at 55° C. for 24 hours and each loop of the culture is spread on two slides. One slide is treated with the Gram stain; the other after fixation by heat is covered with a solution made by dissolving 1 gramme of methylene blue in 20 mils of 95 per cent. alcohol, and adding 950 mils of distilled water and 50 mils of glacial acetic acid. The smear covered with this solution is heated until it begins to steam. It is then heated a second time, and is then left in contact for five minutes. It is then rinsed rapidly with distilled water and covered with the second stain for ten or twelve seconds and rinsed quickly in distilled water. The second solution is made by dissolving 5.5 grammes of vesuvine in 250 mils

of boiling distilled water, filtering while still boiling. The granules clustered at the poles of the bacilli, or only in some of them, show up a black oval, larger than the body of the bacillus. In 800 tests they never found these polar granulated bacilli except with true diphtheria.—Am. J. Pharm., 92 (1920), 54. (J. K. T.)

Soft Drinks.—*Bacteria in.*—Louis Gershenfeld examined 15 samples of different brands of the so-called "soft drinks" for bacteria. Of these samples, two had a bacterial count of less than 100 per mil, three less than 300 per mil, three between 500 and 1,000 per mil, while the other seven showed over 1,000 bacteria per mil. The organisms identified included *B. coli, B. Welchii, B. cloaca, B. subtillis, B. mycoides, B. mesentericus vulgatus,* diphtheroids, streptothrices and molds.—Proc. Pa. Pharm. Assoc., 43 (1920), 289.

Tubercle Bacilli.—*Concentration and Isolation of.*—H. J. Goeckel recommends the following procedure: To the sputum, caseous pus, or moderately cut or minced tissues add a few mils of the sodium hydroxide solution (Rice's Solution No. 2). Mix well and add Rice's Bromine Solution (No. 1) in successive small portions until a clear liquid is obtained. The use of heat is not necessary.

The liquid is then diluted with distilled water to reduce the specific gravity and is centrifuged at high speed to precipitate the bacilli. These are then washed with two successive portions of distilled water, centrifuging to remove the alkali.

The residue is mounted on a miscroscopic slide in the usual manner, using a trace of albumin to fix on the slide.—Med. Rec., through Am. Drug., 68 (Mch., 1920), 30.

Tubercle Bacilli.—*Non-Glycerinic Culture Medium for.*—Since Nocard and Rorex showed, in 1887, that the tubercle bacillus was most easily grown in media containing glycerin, almost all cultures have since been made with such media. Yet these investigators at that time drew attention to the fact that such cultures might possibly be modified by the presence of glycerin. Alilaire and Fernbach find that such is the case. When acacia is substituted for glycerin, abundant cultures of the tubercle bacilli are obtained. These bacilli from the gum media, however,

differ from those grown in the presence of glycerin, in containing much less fatty matter and much more nitrogen. It is possible, therefore, that this strain of the bacillus would prove to be more easily absorbed by the organism, and also, in consequence of its higher nitrogen content, to afford a richer yield of anti-bodies.—L'Union Pharm., through Pharm. J., 105 (1920), 476.

Tubercle Bacilli.—*Staining of.*—Ulrich stains the sample with Ziehl's carbolfuchsin, with gentle warming, then decolorizes with 15 per cent. nitric acid and 70 per cent. alcohol; then counterstains with a solution of 1 part of chromic acid in 100 parts of 60 per cent. alcohol.—Dtsch. Med. Wschr., through Schweiz. Apoth. Ztg., 58 (1920), 165.

Korb prefers in the double staining of sputum for tubercle bacilli to follow the carbolfuchsin by chrysodin stain, rather than by the methylene blue stain, since the latter is apt to cover the red color of the bacilli.—Südd. Apoth. Ztg., through Pharm. Zent., 61 (1920), 90.

Gasbarrini finds lactic acid is better than stronger acids in staining tubercle bacilli. He uses an excess of methylene blue in a mixture of 40 mils of lactic acid and 160 mils of water and at the time of staining mixes with one part of the dye solution, 4 parts of 90 per cent. alcohol.—J. Am. Med. Assoc., through Am. J. Pharm., 92 (1920), 57.

Vinegar Bee.—*Organisms in the.*—L. K. Darbaker reports that in practically all vinegar bees examined there were present two main organisms; *Saccharomyces tyrisormis* and *Bacterium vermiforma.* Other organisms constantly found and isolated were *Mycoderma aceti* and *Mycoderma vini.* A discussion of these, as well as a number of other organisms follows.—J. Am. Pharm. Assoc., 9 (1920), 510.

BOTANY

Annuals.—*Migration of Salts in.*—Taking the common sunflowers as a type, G. André found that the root contained only 5.87 per cent. of the total ash of the plant, at the end of the period of vegetation. This root-ash was poor in phosphoric

and sulphuric acids, rich in potash, containing one-third of the total potash of the plant. It was very poor in nitrogen. The stem contained even less phosphoric acid, and much potash, but no nitrates. The leaves, the total weight of which was one-sixth that of the whole plant, contained nearly half of the total plant ash, about one-fourth of the total inorganic nitrogen, a sixth of the total phosphorus, and almost half the total sulphur. The ash of the leaves was relatively rich in calcium and in magnesium, but poor in potassium. The capitulum had a total ash relatively lower than that of the other organs, but this ash was very rich in potash and phosphates, the former amounting to 30 per cent. of that present in the whole plant. The seeds, amounting in weight to about one-fifth of the whole plant, gave only one-tenth the total ash; yet this ash contained nearly half the total inorganic nitrogen of the plant, and over 41 per cent. of the total phosphorus. The quantity of magnesium is relatively greater than that of calcium in the seeds, as is generally found to be the case; about one-sixth of the total magnesium is found in the seeds.—Bull. Soc. Chem., through Pharm. J., 104 (1920), 353.

Plant Assimilation.—*Production of Starch in.*—The researches of H. Fischer show him that starch is formed in leaves only when the amount of soluble sugars have, because of their osmotic pressure, reached the maximum capacity of the leaf. In some plants, such as narcissus species, this maximum is never normally attained, hence such leaves contain no starch. Fischer however has been able to produce starch in such leaves by artificially increasing assimilation by increasing the amount of carbon dioxide in the atmosphere in which the plant lives.—Naturwiss. Wsch., through Pharm. Ztg., 65 (1920), 294.

Plant Assimilation.—*Influence of Carbon Dioxide on.*—H. Fischer reports that the growth of most plants is largely increased (sometimes two to four times in weight) by growing same in an atmosphere charged with carbon dioxide. He states that the idea has been utilized practically (under patent rights) by a German iron works, which carried the purified gases from their blast furnaces into greenhouses.—Chem. Ztg., through Pharm. Ztg., 65 (1920), 470.

Plant Associations.—Heber W. Youngken directs attention to the fact that one always finds certain plant species growing together under similar conditions. Plant associations are grouped in a variety of ways but the author in his paper classifies them on the basis of their relation to water, the six groups being hydrophytes or water plants, helophytes or marsh plants, halophytes or salt plants, xerophytes or desert plants, mesophytes or intermediate plants, tropophytes or alternate plants.—J. Am. Pharm. Assoc., 9 (1920), 1052. (Z. M. C.)

Plant Enzymes.—*Character of Oxidizing.*—M. W. Onslow, studying the oxidizing enzymes of the potato and the pear, find that these consist of aromatic compounds like pyrocatechin combined with peroxide oxygen groups. Such "peroxide-peroxydoses" directly turn guaiac tincture blue and plant parts containing them darken on exposure to the air. On the other hand, many plant parts contain merely peroxydases (aromatic bodies resembling pyrocatechin) and these do not turn guaiac tincture blue until a peroxide is added.—Biochem. J., through J. pharm. chim., 21 (1920), 233.

Plant Excretions.—*Their Significance.*—K. Gerhardt has studied the rôle of oxalic acid in plants and decides that its function is to remove superfluous and, at times, injurious calcium salts. He also finds that the phenomenon of "guttation," the dropping of water from the leaf-tops of certain plants, is another means of removing superfluous salts. He further finds that those plants where guttation does not occur are the plants in which calcium oxalate crystals are found most abundantly.—Naturwiss., through Pharm. Ztg., 65 (1920), 294.

Plant Growth.—*Effect of Darkness on.*—The fact that the stems and other growing parts of etiolated plants show a great elongation compared with similar plants grown in daylight, is very familiar. No satisfactory explanation of the phenomenon, apart from the evident fact that it is due to the absence of light, has been brought forward. H. Coupin has found when comparative experiments are made by germinating seeds in water, exposed to light; in the dark; and in the dark, in water containing the juice of non-etiolated plants of the same species,

that the last do not show nearly the same great prolongation of growth that is evident in the young plants grown in water only. Where the length of stem of the etiolated seedlings of the water-fed plants exceeds that of the normal light-grown chlorophyll-containing controls by six times or more, the length of the growths in darkness of the plants fed with water containing normal plant juice is only slightly greater than that of the controls. From this it is inferred that under normal conditions the chloroleucites secrete a substance which controls growth. It is, in fact, an internal secretion which profoundly modifies the process of growth. Since etiolated plants have no chloroleucites they cannot assimilate.—Compt. rend., through Pharm. J., 104 (1920), 545.

Plant Organs.—*Preparation of Phosphatides from Colored.*—R. Fritsch examined various plants containing chlorophyll and other plant pigments in order to determine their phosphatide content. Only a small part of the total phosphorus could be traced to the phosphatides of the plants. In the leaves of the maple the phosphatide-phosphorus amounted to 4.78 per cent., in the leaves of the ash to 3.46 per cent. of the total phosphorus. No calcium inosinate was found in the green assimilating organs. In order to obtain phosphatides with the theoretical content of phosphorus, large quantities of tissue must be employed. In grass stored in silos the phosphatides are almost entirely decomposed.—Z. physiol. Chem., through J. Soc. Chem. Ind., 39 (1920), 800 A.

Plant Respiration.—*Carbon Monoxide Is a Product of.*—Langdon and Gailey conclude that the several per cent. of free carbon monoxide which occurs in the floater of the giant Pacific Coast kelp, *Nereocystis leutkeana*, is a respiration product for the following reasons: It forms only when ozygen is present within the floater; it forms as readily in the dark as in the light; it is not formed by enzyme or fermentation process when the substance of the plant undergoes autolysis and decay, and is not formed in killed plants. It is concluded that the carbon monoxide is formed as a product of respiration rather than as intermediate step in photosynthesis.—J. Am. Chem. Soc., 42 (1920), 641. (J. L. M.)

Plant Tissues.—*Effect of Arsenous Acid on Growing.*—R. Cobet observed in plants no improvement in the growth by the application of arsenous acid. Concentrations as low as 1/200,000 were found to be very toxic. Frog spawn and tadpoles were not so susceptible to the toxic effect of arsenous acid, but neither improvement nor retardation in growth of these organisms could be traced to the influence of the arsenic compound.—Biochem. Zsch., through J. Soc. Chem. Ind., 39 (1920), 134A.

Plant Tissues.—*Migration of Copper in.*—Maquenne and Demoussy, by means of the ferrocyanide reaction have been enabled to follow the distribution of copper in various organs of the same plant. As the result of a great number of determinations on nearly thirty different species, including common trees, shrubs, culinary vegetables, fruits, and herbs, it is found that copper occurs in all parts of the plant. At the same time, it is not evenly distributed, but is found in those parts which possess the highest vital activity. Speaking generally, apart from the process of ripening of the seed, the organs which dry up in the process of ageing, part with a considerable portion of their copper, which is transferred to the actively growing tissues with the reserve material. Thus, in shrubs and trees the buds are richer in copper than the wood or the bark. In evergreens the fresh younger leaves contain more copper than the older leaves. It is, moreover, evident that this increase of copper is not due merely to concentration of the juices by evaporation. In this respect the accumulation of the metal in certain organs is of quite a different order from that of the increase of certain inorganic salts, such as silica and calcium compounds. In the case of the ripening of fruits there is an evident concentration of copper in the seeds. In leguminous plants the amount of copper present in the green immature seeds is notably greater than that in the pericarps. As ripening proceeds this increase becomes more and more evident in the former. This is directly opposite to what is observed in the case of calcium salts, which are found to accumulate in the pericarps and also in dead or mature leaves. Moreover, more copper is found in the albumen or the decorticated cotyledons than in their envelopes; in the

kernel than in the shell of nuts; and in the seeds than in the pulp of fleshy fruits. All these facts are in agreement with what is observed during the period of growth, when copper is transferred to the most active tissues. It would appear, therefore, that copper is in some way intimately connected with the vital processes of the plant. At present it is not possible to state what part the metal may play; but the inference is permissible that it is not unimportant.—Compt. rend., through Pharm. J., 104 (1920), 369.

Plants.—*Action of Anesthetics on.*—At a demonstration by Sir Jagadis Chandra Bose, given recently at the India Office, the lecturer gave an account of his investigations into the secrets of plant life, and of the discoveries he had made therein. By means of an instrument known as the Crescograph the highest powers of the microscope were magnified 100,000 times, and by these means one could actually witness the growth of plant life. Sir Jagadis had used anesthetics on several occasions to assist him in the successful transplantation of trees. Such transplanted trees were wont to shed their leaves in the summer instead of the autumn, but this only continued for a time; in due course the trees would behave in a normal manner. The lecturer considered the fundamental unity of life reactions, which he was able to demonstrate between animals and plants, to be of the very greatest importance. Sir Jagadis had observed spontaneous pulsation in certain plant tissues which were comparable to the animal heart-beat. The action of many stimulants, anesthetics, and poisons also seemed identical in both animal and vegetable tissues.—The Hospital, through Am. Drug., 68 (May, 1920), 30.

Plants.—*Action of Poisonous Gases on.*—E. Verschaffelt discusses the action of such vapors as that of chloroform and ether upon the upper and lower surfaces of leaves, the pigments of leaves and flowers and the cell walls. He finds that such vapors produce the breaking up of glucosides, color changes, evolution of benzoic acid (from *Prunus varieties*), of coumarin (from *Anthoxanthum odoratum*) or of alkyl sulphide (from *Allium* varieties.)—Pharm. Weekb., through Chem. Abs., through Chem. Abstracts, 14 (1920), 3698.

Plants.—*The Pectins of.*—In an investigation of cattle foods, A. J. W. Hornby notes that there is considerable variation in the methyl pectate content of different parts of a given plant. The data accompanying this article include determinations of the methyl pectate in different parts of many fruits, roots, tubers, seeds and seed cakes in both fresh and dry states. The pectins occur chiefly in the epidermal tissues and are increased in those parts which were subjected to injury either through insect attack or by mechanical means. Exposure of the potato tuber to light causes an increase in the pectin content. The ease with which methyl alcohol is split off from the pectin would suggest that the latter substance is a protective agent especially in preventing insect attack.—J. Soc. Chem. Ind., 39 (1920), 246T. (C. W. B.)

Plants.—*So-called Carnivorous.*—G. Aulmann has studied the so-called carnivorous plants, such as drosera, pinguicula, dionæa, utricularia, nepenthes and sarracenia. He finds that these plants are not directly responsible for their supposed carnivorous properties. Within their cup-shaped leaves they excrete a juice which chances to be an excellent culture fluid for various forms of bacteria, which in turn digest the animal material that fall into the leaf-cups.—Chem. Ztg., through Pharm. Zent., 61 (1920), 545.

R. Dubois finds that the so-called carnivorous plants do not secrete proleolytic enzymes capable of converting animal matter into peptones, absorbable, despite their colloidal state, by the glands, hairs, or stomata of green plants. Such unusual absorption and assimilation would be of no service to green plants with roots, or for epiphytic green plants without roots, such as *Tillandsia*. The so-called digestion is due to the action of microorganisms and moulds, lower forms of plant life without chlorophyll, and in some cases fixers of atmospheric nitrogen. The crystalloid nitrogen compounds which result from the activities of these organisms can be absorbed and used as food by green plants with roots, and especially by epiphytic, rootless plants. The question of carnivorous plants should be definitely classed as a legend.—Ann. Soc. Linn. Lyon., through Pharm. J., 104 (1920), 523.

Plants.—*Toxicity of Iron to.*—Maquenne and Demoussy find that ferrous salts are much more toxic to young plants than ferric salts. Any condition which tends to facilitate the oxidation of ferrous salts will consequently diminish their toxicity. This explains the beneficial effect of copper sulphate in diminishing the toxicity of ferrous salts to plants, since the former has been shown to exert a catalytic effect on the oxidation of the latter.—Compt. rend., through J. Soc. Chem. Ind., 39 (1920), 606A.

Roots.—*Contractions of.*—Margaret B. Church presents a general review of literature on root contraction. The facts may be summarized as follows: roots do shorten; the parenchyma tissue of the root is the active tissue; cork and vascular traces are passive; the cork is crushed by contraction ultimately; there is a region where wrinkling and shortening both occur, another where shortening but no wrinkling is visible, and an unchanged region; dicotyledons show distorted bundle traces, while monocotyledons have bundles that remain straight during contraction. The author suggests the desirability of study of senial sections coupled with consideration of turgor changes and biochemical alteration of the protoplast and cell walls.—Plant World, 22 (1920), 337. (Bot. Abs.)

Roots.—*Geotropic Response in.*—James Small finds that when roots are placed horizontally in a moist atmosphere rendered very faintly alkaline by ammonia vapor they tend to grow upwards. When stems are treated in a similar way with acetic acid vapor they tend to grow downwards. These experiments form preliminary confirmation of the following theory of geotropic curvature, which has been elaborated as a correlation of previous work on the electrical conductivity of roots with data accumulated by other investigators. The outer zone of the protoplasm in the cells of the apical meristem is an emulsion with a continuous phase of colloidal aqueous solution and a disperse phase of protein or protein-lipoid particles, which show Brownian movement and carry an electropositive charge when the hydrion concentration of the continuous phase is higher than the isoelectric point of the vegetable proteins, or an electro-negative

charge when that hydrion concentration is lower than the isoelectric point of the proteins. The continuous phase or medium in the root is relatively acid, and that in the stem is relatively alkaline. Creaming of the emulsion under the influence of gravity causes differences of potential in the apex of root and stem, which produce electric currents. These produce differences in permeability, turgor, and rate of growth. The direction of these currents is determined by the positive charge in the root and the negative charge in the stem with corresponding downward or upward curvature. The reversal of curvature in the experiments is due to the reversal of the electrical charges on the particles of the disperse phase, which is caused by the changes in the relation of the hydrion concentrations to the isoelectric point of the proteins. This theory explains practically all the details of known geotropic phenomena, including the orientation of the secondary and tertiary branches of roots and stems. It has very wide applications to cytolysis, the stimulus response ratio of the Weber Law, acid-tolerant and calcifuge species, immunity from and liability to attack by bacteria and fungi, the development of intumescences, the effects of acids, alkalies, and salts on plants and animals in general and on the permeability of protoplasm in particular, and possibly also to epharmonic variations. It provides an explanation, not only for the normal polarity of growth in the plant, but also for the changes in geotropic response and in color which occur in flower-buds and other organs. Indications have been obtained that the CO_2 balance in stem and root is the chief factor governing the differentiation in hydrion concentration, and also that phyllotaxis can be explained in terms of the potential differences postulated.—Pharm. J., 104 (1920), 306.

Seed-Coats.—*Silica in Leguminous.*—Solereder has found silica nodules in the palisade epidermis of the seeds of certain species of *Albizzia*, and also in that of *Afzelia cuanzensis* and *A. africana*, but not of *Vicia Faba* or *Tamarindus indica*. The nodules measure up to 4 microns in diameter, and occur just below the light-line. They are well shown in preparations treated with Schultze's maceration mixture, and also by the phenol method, and may be found in the ash left by treating fragments of the

seed-coats with concentrated sulphuric acid and incinerating.—Arch. Pharm., through Pharm. J., 105 (1920), 287.

Seedlings.—*Those Germinated in the Dark.*—It has been stated that certain seeds, and notably those of the genus *Pinus*, do not produce etiolated seedlings when germinated in obscurity, but that the young plants are green, like those grown in light. H. Coupin finds that is not correct. It is true that the seedlings raised in the dark are green, but the shade of the color is brighter and quite distinct from the deep tint of normal plants, and the plants themselves are less vigorous. Pine seedlings normally form two kinds of chlorophyll, one which develops in the dark, the other under the influence of light. The latter is formed very slowly, contrary to what occurs in the majority of plants. Pine seedlings growing in obscurity present no morphological characters of etiolation, apart from the bright green color, except in the hypocotyl axis. The green tint developed in the dark differs in different species. It is very pronounced in *P. sylvestris*, less so in *P. pinea*; while in *P. maritima* the seedlings grown in obscurity hardly differ in color from those germinated in light. Anthocyan occurs abundantly in the epidermis of the hypocotyl axes of all species of *Pinus* grown under normal conditions of illumination; but it is present in traces only in those seedlings grown in the dark.—Compt. rend., through Pharm. J., 104 (1920), 580.

Treub's Hypothesis.—*Discussion of.*—L. Rosenthaler discusses the biological data relating to the hypothesis of Treub that (a) hydrocyanic acid is the simplest nitrogenous product produced by plants; (b) that it is produced in plants by the interaction of carbohydrates and nitrates; (c) that it is the starting point from which plants build the protein molecule. He shows from a dozen pieces of experimental work that the three propositions do not agree with observed facts.—Schweiz. Apoth. Ztg., 58 (1920), 137.

Vegetable Foods.—*Copper Content of.*—B. Guérithault finds that copper is a constant ingredient of vegetable foods. The copper content of vegetable ash ranges from 8 to 63 milligrammes

per 100 grammes, while the fresh material contains from 1 to 17 milligrammes of copper per kilogramme.—Compt. rend., through J. pharm. chim., 22 (1920), 448.

GEOGRAPHIC BOTANY

Aromatic Plants.—*Madagascan.*—A report on the cultivation of ylang ylang, geranium, cloves, vanilla, eucalyptus, etc.

The introduction of some aromatic plants successfully cultivated in Reunion is recommended.—Schweiz. Apoth. Ztg., 58 (1920), 501. (H. A. L.)

Drugs.—*Bedouin.*—The Bedouins make strange customers for the pharmacist. When, on occasion, they visit the towns they sometimes stand outside the pharmacy and shout out that they want a bottle of medicine for five piastres or ten piastres. Generally, they are quite ignorant of the name of the medicine or what it is for. Some, however, after much questioning say they want "heshba," which appears to be the Bedouins' cureall. "Heshba" is a solution of potassium iodide. They are also great swallowers of purgatives and take various cathartic drugs in doses which would appall the average Westerner.—Ind. East. Drug., through Pharm. Era, 53 (1920), 328.

Drugs.—*Chinese.*—Previous to the outbreak of the World War, Germany was shipping dyestuffs into China. Native vegetable dyes no longer appeared on China's lists of exports. The industry has been revived and during 1917 China exported 78,148 piculs (picul equals 133⅓ lbs.) of liquid indigo. China also exported nearly 2,000 tons of dyestuffs, which included black, yellow, red, green and brown dyes.

Large quantities of Chinese ink erroneously called "India Ink" is exported annually. There are various grades of ink, the best comes from the Anhui Province.

The materia medica of China is very rich. The most common drugs include ginseng, rhubarb, licorice, pomegranate root, arsenic, opium and mercury. The great materia medica compiled in the 16th Century is composed of 52 volumes and contains 1,892

drugs and remedies. China exports annually more than 3,000,000 taels worth of medicines.—Pharm. J., 104 (1920), 27. (H. M.)

Drugs.—*Indian.*—Senna is cultivated in the Tinnevelly district of Madras and the yield is 700 to 1,400 lbs. per acre. It is picked about sixty days after sowing and the leaves are dried in the shade. They are graded by the exporter and shipped from the port of Tuticorin in bales of 200 to 300 pounds.

Nux Vomica is widely distributed over India and the seeds after separation from the fruit are sun-dried. They are shipped from West Coast ports in bags containing up to 180 pounds.

Cinchona is cultivated in the Madras and Bengal districts. The acreage is on the decrease owing to the greater profits in tea and rubber culture. The plantations in the northern districts belong to the Government while those in the south are mainly in private hands. Exportation of the bark is controlled by the government and the larger part of the product is used in India.—Pharm. J., 104, (1920), 300. (C. W. B.)

Drugs.—*Stamboul.*—Percival Landon gives an interesting description of the "little market of the spicemen" in Stamboul. The following is an extract: "To the left . . . is a glass tray heaped with a pyramid of dull reddish-brown dust, which only a dyer would know was henna. It is used in the East for more serious purposes than in Paris or London, for did not the Prophet say that the prayer of a greybeard could not reach Allah's ears? As a matter of fact, Mohammed said nothing of the sort, but the widespread conviction among unlettered Arabs that he did accounts not only for the henna there, but for the parti-colored beards of Arab seamen, homeward bound, who have run out of the dye, and return home with an inch of white separating their crimson beards from their deep walnut faces. Here are madder roots from Anatolia and powdered sandalwood from Malabar, blobs of red gum—the dragon's blood of the Yemen—and several kinds of saffron or kurkum. This merchant evidently specializes in dyestuffs, as one can buy here gamboge and the deep scarlet of kermes—the pounded-up bodies of the would-be mothers, of some vegetable parasite. Khol, of course, he has, both dry and fluid, and if you were to ask him, he might find

for you both opium and hashish. . . . His neighbor has tall glass pots full of mullein and lime flowers from Belgrade Forest outside the city, and there is a drawer full of poppy-heads from Ajaristan. . . . He has balsams drained from every tree that science or superstition has sanctified, aniseed and balm of Mecca, galbanum from the giant fennel of Oxio or Mazanderan . . . and cardamons. Pepper that Aldhelm of Sherborne brought back from Kottyam to King Alfred, and turmeric, orange, and yellow and gold. . . ."—Pract. Drug., 39 (Oct., 1920), 38.

Drugs.—*Turkestan.*—E. Swirlowsky describes flora of Turkestan, with special reference to medicinal plants. He names and describes many drug plants which are found there.—Ber. dtsch. Pharm. Ges., 30 (1920), 474. (H. H. S.)

Casparis reports that an analysis of twenty-one samples sent by R. Wacker confirms Dragendorff's report (1872-4) that Turkestan remedies are almost entirely simple plant drugs. Two complex mixtures indicated foreign Oriental origin, and substitution of cinnabar by barium sulphate tinted with water-insoluble coal tar dye, showed Western influence.—Schweiz. Apoth. Ztg., 58 (1920), 497 and 512. (H. A. L.)

Drug Venders.—*Malayan.*—The native drug venders and healers of the Eastern Archipelago rely largely upon astrological and other mystic theories in the treatment of disease. Therapeutic value is assigned to various substances because of their physical rather than their chemical properties. Transmigration and signature theories are also in vogue. The dealers ply their trade in the open and the illustration accompanying the article shows in strong contrast to the more advanced pharmacy of the European and American countries.—Pharm. Era, 53 (1920), 263. (C. W. B.)

Grasse.—*The Home of Perfumes.*—In a resumé by F. Ashford White, the author tells of the ideal climatic condition of the Riviera. This small town on the Mediterranean Coast is the home of the French perfume industry.

Acres of violets, wild hyacinth, narcissus, jonquills, orange blossoms, rose de mai, jassamine, tuberose and cassia, keep val-

ley, hill, slope or highlands in bloom from January to December. The factories are mostly in the town of Grasse in discarded convent buildings.—Am. Drug., 68 (June, 1920), 18. (F. H.)

Gums, Bitumen and Limestone.—*Mesopotamian.*—The small shrubs which yield gum tragacanth grow throughout the entire mountainous region on the north-west frontier of Mesopotamia, and are tapped by the Kurds, who make incisions in the roots after first burning the leaves off the bushes. The first tapping gives white gum of the best quality; that from subsequent tappings is inferior and of a yellow color. The chief collecting center is Suleimanaya, whence the gum is sent to merchants in Baghdad, who export it to foreign countries (130 tons in 1887, 39 tons in 1890). Another gum called "elk" in Arabic is obtained as an exudation from incisions made in the trunk of the tree (known as "buttom" by the Arabs and "gykraswan" by the Kurds), which grows, but only in the valleys, in the part of Kurdistan now occupied by the British. Most of this gum is exported directly from Suleimanaya to Aleppo, where it is used for sizing cloth, and some goes to Baghdad to be used locally for the same purpose and in the preparation of sweets, etc. Both gums are produced in the Mosul Vilayet, but there is no organized trade in them in that district, partly on account of the imperfect roads.

Almost unlimited deposits of crude bitumen and of limestone impregnated with bitumen occur round Hit, but the secrets of lime burning and of refining the bitumen are jealously guarded by the local experts, without whose co-operation nothing can be done in the absence of scientific advice. The possible monthly outputs of lime and of refined bitumen are, respectively, 300 to 150 tons and 600 to 300 tons, calculated from the figures given for the amount of the fuel "siyalla" (a highly-oxidized bitumen) available monthly, but more of this fuel is probably obtainable. —Bd. Trade J., through J. Soc. Chem. Ind., 39 (1920), 16 R.

Medicinal Plants.—*Brazilian.*—Consul Edward Higgins, stationed in Bahia, Brazil, states that this place has an abundant and varied supply of plants, roots, barks, and gums, besides many of recognized value, and some regular articles of export,

like ipecac root, araroba powder, jaborandi leaves, and Jatoba gum. The greater part of these plants exist in practically inexhaustible quantities. He states, however, that orders must be placed in advance with local exporters, as there is no regular trade even in those now figuring among the State's export. The supply depends altogether upon the demand. In his report the Consul gives a long list of the most important medicinal plants found at convenient distances from the city of Bahia.—Am. J. Pharm., 92 (1920), 182. (J. K. T.)

Medicinal Plants.—*Italian.*—In Italy, the General Forestry Department has instructed the associations for the development of the culture of medicinal plants to undertake researches to determine the wealth of medicinal plants in the forests that are the property of the State. With this object in view, representatives of the association visited the forests mentioned and have published a table showing the absence, presence, or abundance of eighty-eight medicinal species in the several forests, as follows: Arnica (*Arnica Montana*) could be gathered in great quantity in the forest of Cansiglio; valerian (*Valeriana officinalis*) abounds in Cansiglio and Sila; conium (*Conium maculatum*), in Monticchio and Gallipoli-Cagonato; male fern (*Polystichum Filix-mas*), in all the forests of the zone of beech and pine; burdock (*Artium Lappa*), black elder (*Sambucus nigra*), hyssop or St. John's wort (*Hypericum perforatum*), germander (*Teucrium chamaedrys*), raspberry (*Rubus idaeus*), common mallow (*Malva sylvestris*), wild thyme (*Thymus serpyllum*), woodruff or queen of the woods (*Asperula odorata*), medicinal or common speedwell (*Veronica officinalis*), mullein (*Verbascum thapsus*) and other species besides are found in all of the forests of State domain. Belladonna (*Atropa belladonna*) could be gathered in a number of the forests. Experiments by the association also show that belladonna and digitalis could be easily propagated by seeds in the forests without requiring real cultivation.—Farmacia, through Pharm. Era, 53 (1920), 242.

Formosa.—*The Home of Camphor.* The National Geographic Magazine of March, 1920, published an elaborately illustrated article on "Formosa the Beautiful," by Alice Ballantine

Kirjassoff, in which an account is given of the camphor production of this island whose "plateaus covered with camphor laurel, are the largest tracts of these valuable trees in the world." The information given should be of especial interest to the pharmacists of the country.—Am. J. Pharm., 92 (1920), 237. (J. K. T.)

Plants.—*Use by Indians.*—O. A. Stevens presents a summary of the information given in Gilmore's "Uses of Plants by the Indians of the Missouri River Region." Passing over those used for food, for beverages, for toys and in the arts and crafts, we find a list of 22 roots, 17 leaves and tops, 2 flowers (*Lilium umbellatum* and *Thermopsis*), 1 berry (red cedar); 2 seeds (hop and sun sunflower), 2 corms (Jack-in-the-pulpit and blazing star), 2 rhizomes (sweet flag and blue flag), 2 root-barks (oak and Kentucky coffee-tree), 1 inner bark (elm) and 2 stems (skeleton weed and the lead plant) that were used as medicines.

Among the medicinal roots are wind flower, blue cohosh, purple cone-flower and burdock. Among the leaves are pasque flower, touch-me-not and rough pennyroyal.—Science, 52 (1920), 99.

DRUG COMMERCE

Crude Drugs.—*Little Adulteration of.*—The adulteration of drugs has become a lost art. The fact that crude drugs now come so near being what they are labeled has induced the chairman of the National Wholesale Druggists' Association's committee on the prevention of adulteration to recommend the discontinuance of the annual report "in order that the time of the members need no longer be taken up by a dead issue."—Bull. Pharm., 34 (1920), 48. (C. M. S.)

Crude Drugs.—*Popular Names of.*—Arno Viehoever urges greater care in the use of common names, particularly the choice of proper common as well as scientific names for new products. The bases of common names are varied. Some are identical with the scientific name of the genus or species; some show slight modifications; others have no apparent connection with the scientific name and may be identical with the native name

or wholly or partly derived from geographical origin. Again the name may be derived from some physical character, like shape, taste, color, odor; or from physiological characteristics. Mr. Viehoever gives examples of all these various names and appends some rules to assist in choosing suitable trade terms. It is best that a name be derived from the scientific name in some way; the name should not be already in use for some distinctly different plant, it should indicate specific character; country of origin is useful; adaptability to international use is advisable; it should be short, easy to spell and remember. The author discusses some attempts to put his suggestions into practice with recently introduced drug plants.—J. Am. Pharm. Assoc., 9 (1920), 671. (Z. M. C.)

MICROSCOPY AND HISTOLOGY

Amebic Dysentery.—*Microscopic Diagnosis of.*—For the fixation and staining of amebas, motile and encysted, Haig makes thin smears from the fresh stool, selecting, where present, a portion containing mucous and blood, on cover slips, and floated, without drying, smear downward, on the following fixing solution:

Sat. sol. corrosive sublimate.....	2 parts
Absolute alcohol .....:.....	1 part

Thirty minutes is the time for complete fixation. The smears are then placed films upward in iodized alcohol in order to remove the last traces of sublimate, washed in distilled water and then stained as follows: (1) Soak for several hours in a four per cent. solution of iron alum (made with violet crystals); (2) wash in distilled water; (3) stain in Heidenhain's hematoxylin for several hours (or over night); (4) wash in distilled water; (5) place in one per cent. iron alum solution until decoloration has reached a satisfactory stage; (6) wash in distilled water and counter stain with five per cent. aqueous eosin solution; dehydrate through the alcohols, clear in xylol, and mount on a slide in Canada balsam.—Am. J. Pharm., 92 (1920), 53. (J. K. T.)

Malaria Plasmodium.—*Staining of.*—Gutiérrez stains the plasmodia by the following method. Mix together 10 grammes each of 1 per cent. methylene blue in methyl alcohol, of 1 per cent.

eosin in methyl alcohol and of methyl alcohol. Pour 10 to 15 drops of this mixture upon the dry blood smear, followed by 20 to 30 drops of *neutral* filtered water. After 1½ minutes, the preparation is rinsed with water, dried with blotting paper and examined under the microscope. The water used need not be distilled but it must be neutral in reaction.—Bull. Porto Rico Med. Assoc., through Am. J. Pharm., 92 (1920), 751.

Microchemical Analysis.—*Methods of.*—A. Mayerhofer presents a series of articles in which he explains in detail, the microchemical detection of copper salts, iron salts, solution of hydrogen dioxide, bismuth salts, and potassium bromide, carbonate, chlorate, permanganate, iodide and sulphate.—Z. Allg. Oest. Apoth. Ver., through Pharm. Zent., 61 (1920), 284, 301 and 315.

Microanalysis.—*Quantitative Drug.*—Albert Schneider discusses briefly difficulties in the way of formulating definite working methods and the chief sources of error in making quantitative microanalytical determinations. In giving a general method he describes carefully how to select the sample, how to reduce it to powder and how to obtain thorough mixing before the diluted suspension is made. Making the count is described in detail as is the method of comparison of the sample being tested with the standard. Furthermore, examples are given which illustrate how the work is done. For instance, Mr. Schneider gives some figures for cassia, cinnamon, insect powder, cloves, cocoa and condition powder. He shows how he analyzed a vomit smear on a scrap of brown paper and how he interpreted his findings.

He outlines the determinations which should be made by students, the drugs used being cinchona bark, rhamnus purshiana bark, senna leaflets, insect powder, digitalis leaves, glycyrrhiza, sublimed sulphur, black pepper, mustard, compound licorice powder. Finally Mr. Schneider gives a list of 78 vegetable drugs and spices and the microscopical characteristics of each substance named, upon which the percentage counts are to be based.—J. Am. Pharm. Assoc., 9 (1920), 1140. (Z. M. C.)

Microscopic Slides.—*Systematized Collection of.*—Fanchon Hart points out that the pharmacognocist should have not only ideal samples, but also should have as comparates adulterants, substi-

tutes and preparations, official or proprietary. As an example, she cites the following as a fair collection to be used in studying ginger.

Set A (Official in the U. S. P. or N. F.)

1. Ginger Jamaica
2. Ginger African
3. Ginger Calcutta
4. Ginger Calacut
5. Ginger Cochin
6. Ginger Japanese

Set B (Commercial Varieties)

1. Ginger Peeled
2. Ginger Bleached

Set C (Adulterants)

1. Exhausted ginger
2. Flour
3. Curcuma
4. Mustard
5. Red Pepper

Set D (Substitutes)

1. Zerumbet root
2. Z. Americanus
3. Cassumuniar root of India
4. Cardamom
5. Galanga
6. Zedoary
7. Banana root

Set E-1 (Proprietary Medicines Containing Powdered Ginger)

1. Ayer's Pills
2. Beecham's Pills
3. Bliss Native Herbs
4. Blancard's Apiol and Steel Pills
5. Powell's Popular Pellets

Set E-2 (U. S. P. Preparations Containing Powdered Ginger)

1. Aromatic powder
2. Gregory's powder

Set E-3 (N. F. Preparations Containing Powdered Ginger)

1. Rubefacient spice powder
2. Composition powder

—Proc. N. Y. Pharm Assoc., 42 (1920), 210.

Microscopic Stains.—*In Pencil Form.*—E. Friedberger has devised a set of microscopic stains in convenient pencil form. One is "universal," consisting of violet Gram color, which stains a number of micro-organisms including gonococci. Another is for the tubercle bacilli, containing fuchsin and phenol. The third contains the Giemsa stain, while the fourth is for red and blue, double staining.—Münch Med. Wsch., through Pharm. Zent., 61 (1920), 302.

Microscopic Stain.—*Romanowski.*—Romanese reports having worked out a simple and reliable substitute for the Giemsa stain, affording results exactly like those of the latter. The stain is made as follows: Dissolve 0.75 Gm. methylene blue in 50 mils 95 per cent. alcohol and 50 mils glycerin, add 3 mils 10 per cent. aqueous sodium carbonate solution, and boil for 15 minutes; then add 35 mils of a 1 per cent. alcoholic solution of eosine, and boil again for 15 minutes, then remove from the fire, and when cool, add alcohol to make 100 mils; then set aside, closely covered, for a week.—J. Am. Med. Assoc., through Merck's Rep., 29 (1920), 94.

Microscopy.—*Analytic.*—T. E. Wallis publishes a well-prepared discussion of recent and improved methods of examination with the microscope of the following classes of materials: cereal foodstuffs, drugs and spices, galenicals, feeding cakes and farm seeds, jams and preserves, deposits from water and other liquids, fibers of fabrics and paper.—Pharm. J., 104 (1920), 247, 349, 395, 541 and 578: 105 (1920), 159 and 283. (E. N. G.)

Seed Integuments.—*Studies of.*—C. Van Wisselingh presents valuable and exhaustive studies of the seed coats of the Onagraceæ, the Lythraceæ, the Centrospermæ, of *Tropaolum hypericum* and of *Ipomœa*. The papers discuss the subject from the microchemical and the pharmacognostic standpoint and are profusely illustrated.—Pharm. Weekblad, 57 (1920), 77, 125, 575, 606 and 1195.

Microscopic Staining.—R. E. Liesegang points out certain fallacies in staining microscopic sections, particularly when the purpose is the study of soluble inorganic salts. The proteid and lipoid cell contents interfere with the adsorption of the reagent of the section, gives no reaction in the interior for the simple reason that it has not been able to penetrate to the centre.—making a strong stain with the tissue ingredient at the periphery Z. Wiss. Mikroskopie, through Pharm. Zent., 61 (1920), 283.

Weeds.—*Detection in Flour and Bread.*—E. Spaeth triturates a small quantity of flour or bread (1 to 2.5 grammes) with sufficient water to obtain a thick paste and rinses this into a beaker

with sufficient water to obtain about 100 mils of mixture. Then 10 mils of 10 per cent. hydrochloric acid are added, the mixture is boiled for a short time and, after allowing to cool, potassium hydroxide solution is added until an almost clear liquid is obtained. The mixture is then centrifuged, the clear liquid decanted and the residue washed by the addition of water and renewed centrifuging. This process is repeated until all the alkali is removed. In the absence of a centrifuge the residue may be purified by sedimentation. The insoluble matter is then viewed through a microscope. Thus the author could identify in bread and flour, agrostemma, githago, darnel, cow weed, etc.—Suedd. Apoth. Ztg., through Pharm. Weekbl., 57 (1920), 183. (H. E.)

PHARMACOLOGY AND THERAPEUTICS

Adsorption Medicines.—The chief therapeutic value of this class of remedies lies in the fact that large dosage can be employed with an assurance of slow liberation of the active agent, thus securing a prolonged rather than a mere delayed action. H. R. Jensen notes that emetine and cinchonidine have each been used in combination with bismuth iodide in the hope of securing prolonged action of these alkaloids, but as these colloid mixtures are irritant, the results have not been fully satisfactory. Clinical experiments show that the fuller's earth adsorption compounds of ipecac devised by Lloyd possess greater stability than the bismuth combinations and, owing to the slower evolution of the alkaloid, are much better tolerated. This article gives specific data regarding the alkaline decomposition of ipecac adsorptions. In discussing the preparation of these compounds the writer states that adsorption is generally greater in aqueous than in alcoholic solutions and in strong rather than in weak concentrations. Earths with high calcium and iron content and low in alumina give best results. The adsorptive power can be increased by repeated lixiviations. Ipecac adsorption products prepared from galenicals containing the total alkaloids are inferior to those manufactured from preparations free from cephaeline. Adsorption compounds of hyoscyamus, opium, cinchona and the dye antiseptics are noted and the physico-chemical theories of adsorption are briefly reviewed.—Pharm. J., 105 (1920), 97. (C. W. B.)

Anesthetics.—*Local.*—Launoy and Fujimori examined the benzoyl derivatives of a number of amino-alcohols of the formulæ, $(CH_3)_2N.CH_2CR(OH).CH_3$ and $(CH_3)_2N.CH_2.CH_2CH(OH)R$, in respect to their toxicity, their hemolytic action on red blood corpuscles, and their anesthetic properties. Of the first series, to which stovaine belongs, the benzoyl derivatives of 2-methyl-2-ethyl, 2-amyl-, 2-phenyl-, and 2-benzyl-propanol were investigated, and of the second series the derivatives of 3-ethyl- and 3-amyl-propanol. The derivatives of the second series were less toxic than those of the first, whilst those of the alcohol containing five carbon atoms were the most poisonous. Of the aromatic derivatives the benzyl-propanol derivatives were more toxic than the corresponding phenyl compounds. The hemolytic action on red blood corpuscles increased with increasing molecular weight; it appeared also to increase with increasing separation of the hydroxyl and amino groups. The anesthetic action of the tertiary alcohols is superior to that of the secondary, and the maximum is attained with the C_5 alcohols.—Compt. rend. Soc. Biol., through J. Soc. Chem. Ind., 39 (1920), 81A.

Antiseptics.—*Action on Molds and Yeast.*—Beal and Perry studied the conditions most favorable to the growth of the specific organisms. The table given below shows the concentrations necessary to inhibit and prevent gas formation and growth of molds.

Preservative	Saccharomyces cerevisiæ: Gas formation %	Saccharomyces cerevisiæ: No living organisms %	Penicillium glaucum: Gas formation %	Penicillium glaucum: No living organisms %
Alcohol, without cap	16	20	8	17
Alcohol, with cap	11	15	8	14
Sodium salicylate	1	9	3	5
Sodium benzoate	0.5	3	none in 0.25%	5
Sodium sulphite	0.6	12% not sufficient	12% not sufficient	12% not sufficient
Sodium acid sulphite	none in 0.25%	10	none in 0.25%	6
Formaldehyde	none in 0.25%	none in 0.25%	none in 0.25%	0.4

—J. Ind. Eng. Chem., 12 (1920), 253. (L. A. B.)

Boils and Carbuncles.—*Treatment of.*—Staphylococcic infections have been treated with great success, according to Reynolds who recommends dilute sulphuric acid, made by adding three fluidounces of strong acid to 29 fluidounces of water, the dose being 20 to 30 minims diluted with a wineglassful of water. Smaller doses of a weaker strength acid are of no use whatever. Reynolds states that throughout his experience the treatment has always been well tolerated, and without exception proved successful.—Lancet, through Chem. & Drug., 92 (1920), 522.

Botulism.—Two recent fatal outbreaks of "food poisoning," which were reported from the West, have been attributed to botulism intoxication from ripe olives packed in California. This condition is brought about by the presence of *Bacillus botulinus* in canned foods that have been imperfectly sterilized. It seems that this germ may be more resistant to heat sterilization than early statements led us to believe. It cannot be too strongly impressed on the house-wives of the country that in household canning, heat must positively be employed at a high temperature and for a considerable time. This also applies to those who are interested commercially.—Am. J. Pharm., 92 (1920), 28 and 197. (J. K. T.)

Cancer.—*Test for.*—F. Klein finds the following test of value in cancer diagnosis: to 4 mils of urine add 10 minims of N/100 Iodine and an equal volume of hydrochloric acid, sp. gr. 1.19. If urine is malignant a canary yellow color is obtained. The normal urine gives an orange brown coloration. Solution of ammonium sulphide, sp. gr. 1.25, may be used as a check test, and if urine is dark, treat with 20 per cent. lead acetate solution and filter. In his paper Klein also gives a urinary test whereby he claims to determine the vitality of the patient.—Pract. Drug. 39 (Sept., 1920), 24. (J. M. W.)

Disinfection Solution.—*For Soda Glasses.*—L. E. Sayre and F. A. Patty report the results of considerable experimentation undertaken to devise means of disinfecting soda glasses. Three organisms were used in the tests, *Micrococcus aureus, Bacillus typhosus*, and *Streptococcus pyogenes*. They found that solutions containing available chlorine were the only satisfactory ones,

the efficiency apparently depending also on the degree of alkalinity. The most efficient solution contained 0.05 per cent. of available chlorine with an alkalinity requiring 5 mils of N/10 hydrochloric acid for each mil. They found boiling water unreliable. A detailed formula is given for preparing the solution. —J. Am. Pharm. Assoc., 9 (1920), 1093. (Z. M. C.)

Disinfectants.—*Simplified Determination of Phenol Coefficient of.*—Albert Schneider reports a new method in which *Paramecium caudatum* is the test organism. He gives careful directions for making the mixing loop and then the loop mixture and the examination of the mixture. He explains the making of trial dilutions of the disinfectant when it is a liquid and when it is a soluble solid; how to calculate the phenol coefficient from the minimal killing dose for the paramecium. The behavior of the test organisms is very carefully described as well as the adjustment of the *Bacillus typhosus* phenol standard and the *Paramecium caudatum* phenol standard.

About twenty-five disinfectants and toxic substances were tested by college students in the course of their regular work and rather striking uniformity in results shown. Comparison of the old method with this one shows its simplicity, the small amount of equipment, uniformity of results obtained by different operators, and much reduced time and expense. Finally, Dr. Schneider believes the test organisms to be as valuable an indicator as *Bacillus typhosus.*—J. Am. Pharm. Assoc., 9 (1920), 580. (Z. M. C.)

Drug Idiosyncrasy.—Opening a discussion at the meeting of the West London Medico-Chirurgical Society on idiosyncrasy to drugs, Sir William Hale-White divided idiosyncrasies into two classes—apparent and real. The former are sometimes explained by the impurities, or varying composition of drugs, ergot, digitalis, lead, and opium being examples. Apparent idiosyncrasies may also be caused by disease. Passing to genuine idiosyncrasies, reference was made to iodides—half a grain daily for two days had caused iodism, while 300 grains a day had been given without any symptoms of it. The idiosyncrasy of some persons to aspirin and zinc sulphate was also referred to.—Chem. & Drug., 92 (1920), 522.

Drugs.—*Influence of Colloids on Action of.*—The observations of Kunz-Krause (see page 96) on the comparative activity of extract of belladonna and its alkaloid, atropine, led Loffler and Spiro to test out their suggested explanation that the presence of some colloid in the solvent acts as a protective colloid for the alkaloid. They find that gelatin interferes with the action of histamine on the small intestines of guinea pigs and the interference is proportionate to the amount of gelatin present. This is not due to increased viscosity of the solution since gum arabic and tragacanth, which cause smaller viscosity changes, have a similar effect. It is not a specific effect of the added colloid since the same colloids when added to adrenaline, opposite in effect from histamine, show a similar interference with the effect of the drug. Serum increases the effect of both histamine and adrenaline. Milk interferes with the action of histamine; when the protein is removed the interference largely disappears.—Kolloid Ztg., through Pharm. Era, 53 (1920), 208.

Drugs.—*The Physical Side of Pharmacological Action.*—I. Traube finds that the pharmacological action of drugs and toxins is mainly due to their physical properties. It is urged that more attention ought to be given to the physical side of these principles in the study of chemotherapy.—Biochem. Zsch., through J. Soc. Chem. Ind., 39 (1920), 133 A.

W. Heubner rejects the physical theory of pharmacologic action advanced by J. Traube. Heubner believes that living nature is the extreme opposite "of onesidedness." He recommends caution in accepting general rules for pharmacologic action.—Pharm. Zent., 61 (1920), 386. (O. M.)

Drugs.—*The So-called "Physiologically Inactive."*—In an address before the National Eclectic Medical Association, J. H. Beal deprecates the tendency in modern medicine of considering that an agent without poisonous quality, must necessarily be devoid of medicinal activity. In combating this doctrine, Beal cites vitamines and the historic controversy on the therapeutics of coca.—J. Am. Pharm. Assoc., 9 (1920), 1207.

Drugs.—*Use in Disease.*—At the 1920 meeting of the New Jersey Pharmaceutical Association, R. G. Eccles read a remark-

ably thoughtful paper upon the subject of practical pharmacology. As it defies condensation, the reader is referred to the original.—Proc. N. J. Pharm. Assoc., 50 (1920), 31; Am. J. Pharm., 92 (1920), 450.

Fashion in Therapy.—Since medicine is not an exact science, the medical profession is influenced by fashion just as much as any other portion of the world. For a time, leeches were the only remedy used for inflammation, today only a few physicians employ them. Sarsaparilla, because it was rated high, is unjustly cast aside because it can never do all the things claimed for it.

Arsenic has had a queer history, and on account of its uses being greatly exaggerated, especially in skin trouble, its use has greatly fallen off. On the other hand, organic arsenical compounds are gaining a reputation and are becoming routine weapons against syphilis.—J. Am. Pharm. Assoc., 9 (1920), 450. (M. O'C. D.)

Hay Fever.—*Causes of.*—Seasonal "hay fever" is most prevalent in Europe during the period of the flowering of the grasses, and is generally attributed to the protein of the pollen of these, to the toxic action of which some individuals are extremely sensitive. In America "hay fever" is most apparent in the autumn, and is caused by the pollen of the American golden rod and other composite weeds. Besides these seasonal outbreaks, a perennial form of coryza is found. This, J. C. Walker traces to various causes, but all due to individual sensitiveness to the proteins of various animals or to vegetable articles of diet. Horses, cats, domestic pets, and feathers, are all capable of causing the trouble in those who are specially sensitive to their peculiar proteins. In the case of horses, where contact with the animals is unavoidable, inoculation with the protein of horsehair and dandruff in a 1:1,000,000 solution, in progressive doses of from 0.1 to 0.8 mil, will afford relief. With other animals the same treatment is successful; but it is obviously simpler to avoid contact with the animal. In those reacting to feather protein, sleeping on a feather pillow will bring on an attack. Cure is effective by changing this to a flock pillow. Many farinaceous

foods and other vegetable foods are responsible for similar symptoms.—J. Am. Med. Assoc., through Pharm. J., 105 (1920), 401.

Influenza.—*Treatment of.*—In a comprehensive paper on influenza, the first record of which, it is stated, dates from 1367, it is claimed that Marcovici cured the disease in 24 hours by use of 0.3 to 0.5 gramme doses of calomel followed 8 hours later by a mixture of 0.5 gramme acetylsalicylic acid and 0.1 grammes of caffeine.—D. A. Apoth. Ztg., 40 (1920), 159.

Nascency.—*An Intensifying Force in Therapeutics.*—George Lunan, states too little credit has been given to the therapeutic advantage of nascent chemical action at the moment of administration and subsequently in the living body.

Wherever rapid ionism is produced by nascent chemical action the physiological reactions are marked.

Thus glycerite of boroglycerin, when hydrolyzed, is decomposed into nascent glycerin and boric acid. The reaction is an exothermic one and its nascent products penetrate the mucous surface and the physiological effect is much stronger than if ordinary glycerin and boric acid had been used uncombined.

Quinine in ammoniated tincture of quinine, when diluted with water, is resolved into the alkaloid in a nascent state.

Preparations which generate nascent carbon dioxide, such as Seidlitz powder, are superior to alkaline "soda water" from a bottle or syphon.

Lunan speaks of the difficulty of prescribing hydriodic acid and says what is wanted is a stable organic base which would readily yield nascent iodine in minute quantity.

Eusol, an antiseptic, illustrates the activities of nascent chlorine.

There are difficulties in giving bismuth salts but this might be overcome with two separate solutions properly adjusted.

The administration of small daily doses of magnesium and sodium sulphate has its raison d'etre in the formation of nascent hydrogen sulphide by reduction of the sulphate to sulphide. This method produces nascent sulphur.—Pharm. J., 104 (1920), 208. (J. M. W.)

Nits.—James Dunning renders some interesting information on this subject, as well as photo-micrographs showing how the eggs are attached to the hair.

In treatment for their removal the following recipe is recommended: linseed oil 4 oz.; liquid petrolatum 4 oz.; perfuming oil, 1 dr.; oil-soluble aniline orange q. s. This will not dissolve the coating but will soften them sufficient to remove them with a fine comb. This recipe "also answers admirably as a polish for varnish floors or can be used with O-Cedar Mops."

Mr. Dunning also recommends the following recipe for "French Powder."

Powdered naphthalene	5 oz.
Flowers of sulphur	3 oz.
Armenian bole	2 dr. or q. s.

This can be sprinkled freely in the inside of the clothing.

Lastly, he offers a recipe for the removal of the crab louse. Two or three applications should be sufficient for their removal, then shampoo the part with hot water and soft soap.

Sublimed sulphur	1½ oz.
Mucilage of acacia	1 oz.
Methyl alcohol	½ oz.
Solution of cochineal	½ dr.
Water, q. s.	8 oz.

—Pharm. J., 104 (1920), 5. (H. M.)

Oral Hygiene and Oral Antiseptics.—W. F. Gidley directs attention to the importance of oral hygiene, citing many authorities to show the serious conditions which may be traced to oral infections. He enumerates the essentials of a good antiseptic for use in the mouth. The relative value of some common mouth washes is considered.—J. Am. Pharm. Assoc., 9 (1920), 370. (Z. M. C.)

Pharmaceuticals.—*Dutch Study of Proprietary.*—The minister of labor of the Netherlands officially inaugurated, on September 1, the government "Instituut voor Pharmaco-Therapeutisch Onderzoek," which seems to be modeled after the Council on Pharmacy and Chemistry of the American Medical Association. The minister of labor remarked in his opening address that the

Netherlands has had a permanent pharmacopœial commission since 1899. But this does not attempt to keep pace with the flood of new remedies, and the government has finally heeded the appeals of the Netherlands Medical Association and the Pharmaceutical Association and has founded this institute. The Council on Pharmacy and Chemistry of the Netherlands is to have the support and backing of the government; the Council on Pharmacy and Chemistry of the American Medical Association has only the backing of the medical profession.—J. Am. Med. Assoc., 75 (1920), 1279. (W. A. P.)

Pharmaceuticals.—*German Study of Proprietary.*—It is proposed that the commission founded years ago by the German internists—the Arzneimittel-Kommission—is to be changed into an institution to investigate new pharmaceutical articles and supply information thereon to physicians on demand. An information bureau and bibliographic center is planned, and it is proposed to test new inventions for the manufacturers. The commission announces that it has been decided not to restrict the examinations to the chemical, pharmaceutical and pharmacologic side of the matter, but in given cases tests and investigations at the bedside will be made. It is stated that the pharmacologic investigations are to be made at the pharmacologic institute of the University of Berlin, which is in charge of Heffter, and that the institute is to be the headquarters of the new Prüfungsamt.—J. Am. Med. Assoc., 75 (1920), 1791. (W. A. P.)

Phthirus Pubis.—*Extermination of.*—Dr. P. Payot experimented with this parasite commonly known as crab lice, using alcohol, benzin, ether, 2 per cent. lysol solution, gasolin, sublimate solution (1 in 1,000) xylol, xylol and ether, 5 per cent. ointment of xylol in petrolatum, 10 per cent. ointment of benzin in petrolatum, plain petrolatum, borated petrolatum, mercurial ointment and white precipitate ointment. He finds mercurial preparations are almost worthless and that the best remedy consists of fat solvent such as petrolatum ointments containing xylol or benzin. Apparently the author overlooked the possibilities of larkspur and cevadilla.—Schweiz. Apoth. Ztg., 53 (1920), 549.

Plant Dermatitis.—E. P. Smith divides irritant plants into two groups; those having an irritating cell-sap, and those in which the active principle is excreted. Of the former group four cases are discussed in the present paper. Nettle poisoning is described as caused by the penetration of the skin by slender flask-like hairs the tips of which break off, allowing the injection of the cell-sap containing formic acid, albuminoids, etc. The formic acid is not a sufficient cause especially in extreme cases in the tropics. The symptoms are discussed. Primula poisoning is sometimes severe. Rhus poisoning was found by Paff to be due to an oil which he extracted and purified. This is produced by all parts of the plant, even the pollen. Thorough scrubbing with soap and water is the best remedy. In the Scilly Isles the flower pickers are troubled with "lily disease" which is due to the juice of various species of Narcissus. Oil of jonquil is not the cause of this, but probably the raphides, which are abundant. In a second paper Smith discusses lacquer poisoning. This type of poisoning is not common in England, but is very frequent in Japan and China where the lacquer industry is considerable. Lacquer is made from the juice of *Rhus vernicifera* and these are real cases of rhus poisoning. Confectioners often suffer from vanilla dermatitis, which is probably due to oil of cashew. The dust from certain fine woods often irritates the skin or mucus membrane of workers in these woods, as satinwood, teak, ebony, rosewood, olive-wood, box, coco-wood, and partridge-wood. The poisonous substances are apparently normal products of metabolism in the plant, and are only discovered by accident to be poisonous. Thus the sporadic occurrence of poisonous member in a group is probably not really sporadic, for the poisonous qualities of other members have not been discovered. The biological significance of the poison must be worked out with care to avoid hasty inferences. From the point of view of human contact there are two types of substances: one soluble in water (e. g., nettle), the other of oily nature (rhus). Specially sensitive skin may be affected by almost any combination of rough hairs with exhuded cell-sap. Personal idiosyncrasy plays a very important part in dermatitis. A list is given of forty-two plants known to cause dermatitis, and a bibliography of the subject is appended.—J. Bot., 58 (1920), 130 and 173. (Bot. Abs.)

Poisons.—*Relation of Toxicity to Age of Animal.*—At a meeting of the Société de Thérapeutique, Lesne and Binet pointed out that experiments with strychnine, morphine and cocaine on cats and mice showed that age was an important factor as far as resistance to poisons are concerned. Young animals can stand much larger doses than older ones, the resistance being evidently due to the vitality of youth and the more ready functioning of the antitoxic glands.—J. Pharm. Chim., 21 (1920), 141.

Radio-activity in Life.—Isolated frogs' hearts, previously brought to a standstill with potassium-free Ringer's solution, were perfused by H. Zwaardemaker with solutions of salts of the radio-active metals, rubidium, potassium, uranium and thorium; each radio-active element in proper doses sufficed to restore pulsation, whereas none of the salts of the non-radio-active metals did so. It is therefore concluded that the presence of a radio-active salt is necessary to the recovery and maintenance of normal pulsations. The dose must not be too large, since excessive quantities are harmful. Calcium inhibits the effect of radio-active metals, and increased quantities of its salts necessitate increasing the dose of radio-active salt to overcome the inhibition. Radio-activity as a possible cause of heart-beat is discussed. It is found that the absence of a radio-active element in the kidney allows the passage of sugar and throws the muscular walls of the arterioles out of action. Normal activity is restored by the introduction of a radio-active element.—Arch. Nederl. Physiol., through Pharm. J., 105 (1920), 379.

Ringworm.—*Treatment of.*—W. P. Elford describes a quick method of treating ringworm, and claimed that the majority of cases are successfully dealt with within a month. Dr. Elford says: "The affected area of the scalp must be shaved and cleansed with liquid ethereal soap. The part is then gently and carefully rubbed with a piece of lint which has been dipped in liquor potassæ and dried with a piece of cotton-wool. Next the part is sprayed with ethyl chloride for about thirty seconds and allowed to dry; it is then painted with tinct. iodi mitis. It is unnecessary to repeat the shaving and cleansing with ethereal

soap, but the remainder of the procedure should be carried out morning and evening for the first three days and once daily during the subsequent four or five days." A week of such treatment usually effects a cure, after which ointment of ammonicated mercury is rubbed into the scalp twice daily. Folliculitis, which may have appeared, quickly subside and healthy hairs soon make their appearance.—Brit. Med. J., through Chem. & Drug., 79 (1920), 1283.

A Shotgun Mixture.—It is stated that the following prescription is used with success in "intestinal cases of a medical type": zinc sulphocarbolate, 0.5; bismuth subnitrate, 15.0; bismuth betanaphtholate, 8.0; camphorated tincture of opium, 15.0; syrup of acacia, 30.0; elixir of lactopeptine, to make 130.0. In this, the chief active ingredients are bismuth subnitrate and camphorated tincture of opium. The zinc sulphocarbolate is superfluous. The action of the bismuth betanaphtholate probably does not differ from that of bismuth subnitrate, and cinnamon water or simple elixir might as well be substituted for elixir of lactopeptine.—J. Am. Med. Assoc., 75 (1920), 335. (W. A. P.)

Sick Headaches.—*Some facts about.*—Dr. Bernard Fantus recommends the following mixture as a relief for migraine or sick headaches: "Sodium salicylate 1 gm., potassium bromide 2 gms." It is essential that the dose be taken so soon as it is noticeable that a headache is approaching. If one dose is not sufficient, another should be taken, but not after the characteristic ringing in the ears has begun, indicating salicylism.—Pract. Drug., 39 (Oct., 1920), 25.

Skin Absorption.—*Facilitating.*—P. G. Unna finds that the addition of pepsin to skin preparations frequently facilitates the absorption of such medicaments as salicylates, cocaine hydrochloride, morphine hydrochloride, quinine hydrochloride, adrenalin hydrochloride, strychnine hydrochloride and atropine sulphate. The last three affect the activity of the pepsin to a certain extent.—Berl. klin. Wsch., through Pharm. Zent., 61 (1920), 414.

Snake Poisons.—*Antidotes for.*—Experiments looking toward the production of anti-venom for snake poisoning seems to have met with some success, but the use of these products in therapy is still in the experimental stage. In general it has been shown that an anti-venom prepared for one species is not always effective when used against the venom of another species.—J. Am. Med. Assoc., 75 (1920), 51. (W. A. P.)

Sun Treatment.—Lovett reports successful results in a series of carefully observed cases of chronic suppuration in a children's hospital, which were treated by a new way of applying heliotherapy by means of a lens. It had been used by Mrs. E. C. Post in her sanatorium at Porsmeur, in Brittany, it having first been suggested to her by M. de Thézac. The essential of the treatment is the concentration of the sun's rays by means of a double convex lens, diameter, 12 inches, and focal length, 6 feet. At the focal point, of course, the heat is too great, and in general the patient should be placed at a point where the sun's rays form a circle from 3 to 5 inches in diameter. As the lens is moved away from the patient the heat of course increases, and when moved nearer, it decreases. Moving it thus back and forth is the method of regulating treatment. The lens is mounted a few inches from the end in a canvas cylinder, 1 foot in diameter and 3 feet long. The advantage of the cylinder is that it enables the lens to be pointed directly at the patient and makes the application more definite. The cylinder is on a tripod and can be turned in any direction. The duration of treatment must lengthen progressively, at first, five minutes, increasing five minutes each day until a limit of thirty minutes is reached. In one case a longer period, up to one and one-half hours, was used without harm. The skin around the wound is, as a rule, protected by towels, and the operator wears colored glasses. One treatment a day was given. The effect of the treatment on suppurating wounds was perfectly definite. The method seems free from risk when used as directed.—J. Am. Med. Assoc., through Drug. Circ., 64 (1920), 381.

Sweating Feet.—*Remedy for.*—Lopez uses for this purpose a dusting powder consisting of 60 parts of alum and 40 parts of talcum. Considering hyperhydrosis as due to incipient at-

tenuated tuberculosis, he recommends the administration of extremely minute doses of tuberculin as a part of the treatment. —Semana Med., through Am. J. Pharm., 92 (1920), 682.

Tetanus.—*The Elimination of.*—During trench warfare the prompt cleansing of wounds and the injection of anti-tetanic serum practically stamped out tetanus and gas gangrene. The antiseptic treatment of uniforms and clothing, so that even should pieces be forced into the wound, infection might be avoided, was proposed, and Taylor and Davies reported excellent results with pixol (a mixture of cresol and soft soap); Carnot, with copper and zinc soaps. But Heim, Fernbach, and Rullier decided to experiment further, and they found that a double impregnation of textiles, first with hydrofluosilicic acid (7.5 per cent.), and afterwards with coal oil (5 per cent.), to which a solution of mercuric chloride (1-4000) has been added, gives a maximum of safety.—Pract. Drug., 39 (Feb., 1920), 34.

Removing Tattoo Marks.—Tattooing is the mechanical introduction of pigments under the skin and a very well known process. The pigments employed are carbon, cinnabar, carmine and indigo. Most methods employed to remove these marks are by a reactive and a destructive inflammation which will result in the formation of a crust, later cast off together with the tattooed markings. One method is to retattoo the marks with a solution of 30 parts of zinc chloride and 40 parts of water. A mild inflammation will result; a crust forms and about a week later this falls off, leaving a scar which gradually heals. Later a repetition of this may be necessary. This may be done by the professional tattooer. The second method is to tattoo again, making the punctures close together after the design has been drawn over with a concentrated solution of tannin. A stick of silver nitrate is then firmly drawn over the surface and after a period of several minutes it is then wiped off. This is far more effective than the first and less scar forms. Two other substances, perhaps more efficient than either of the above, and applied in the same manner as the first, are caroid and glycerole of papoid.—Science and Invention, through Pract. Drug., 39 (Dec., 1920), 36.

Tuberculosis in 1920.—Lereboullet and Petit writing in the *Paris Medical Journal,* make mention that the prophylaxis and hygiene rather than the medical side of this dread disease engrossed attention the past year. Important papers on the medical features were those of the detection of the falsely labeled tuberculins. They say that compulsory declaration of tuberculosis seems to have been postponed to the day when the declaration will ensure care and assistance to the patient and his family. It has been brought out that the presence of the tubercle bacilli in the sputum does not necessarily prove that the lesions are in process of evolution, and also that the absence of the germs is not unfailing testimony as to the non-activity of the lesions.—Am. J. Pharm., 92 (1920), 425. (J. K. T.)

Tuberculosis.—*"Cerium Salt Treatment" of.*—Koch studied the effects of many chemical substances, including a gold cyanide compound, on the growth of the tubercle bacillus in cultures, and concluded that all these substances remained completely inactive when tested upon the tuberculous animal. Compounds related to guaiacol and creosote came to have a widespread reputation as tuberculocidal agents without any one's taking the trouble to ascertain definitely whether they really had any particular capacity to injure tubercle bacilli in the test tube, the tuberculous animal or the consumptive patient, although the German manufacturing chemists provided innumerable proprietary derivatives of these drugs. Some time before the war, a "complex lecithin-copper compound" of unannounced composition was put forward in Germany. Another copper cure came from Tokyo, "cyanocuprol" of Koga. Other copper compounds, such as copper arsphenamine, also were brought out. But none of these copper compounds have settled the tuberculosis problem. Recently, newspapers have given publicity to the treatment of tuberculosis by the so-called cerium earth salts in France. It appears that a few observations have been made on the inhibitory action on the growth of tubercle bacilli of salts of cerium and some other rare earth metals. The inhibitory action was less than that observed in the past for these chemical substances, and there is no record of experiments to determine their effect on experimental tuberculosis. Possibly

cerium earth salts help the tuberculosis; the evidence so far presented, however, is nothing to get excited about.—J. Am. Med. Assoc., 75 (1920), 246. (W. A. P.)

Tuberculosis Infection.—Calmette makes the assertion that many kinds of bacteria circulating in the blood are eliminated by the intestine; the bacillus of tuberculosis in particular is taken up by the liver and emptied into the intestine with the bile. Experiments have shown that tuberculosis is spread among cattle by the excreta, and this explains infection occurring in stables, and also the presence of tuberculosis bacilli in milk, even that from healthy cows. This fact also draws attention to the spread of tuberculosis through vegetables, due to contamination with tuberculosis manure, and its propagation on farms and in the rural districts.—Ann. Inst. Pasteur, through Am. J. Pharm., 92 (1920), 54. (J. K. T.)

War Malnutrition.—*Effect on Doses of Medicines.*—Dr. Zernik notes some curious effects of the under-nourishment that the war brought to Germany. One instance was the fact that the production of epinephrin had to be practically discontinued, since the suprerenal glands of poorly-nourished animals contained little or none of that substance. Again, its effects were shown in some cases by extreme sensitivity to medicines; normal doses of narcotics and sedatives producing alarming symptoms.—Dtsch. med. Wschr., through D-A. Apoth. Ztg., 41 (1920), 139.

DRUG STANDARDIZATION

Biologic Assaying.—*Its Scope and Limitations.*—Herbert C. Hamilton discusses these questions in a thorough going fashion answering the various objections commonly heard. He defines biologic assaying as "the use of animals as a means of standardizing drugs by comparing the action of two samples of the same drug, one of which is of known activity" and believes that strict adherence to this definition "will eliminate most of the objections which have been most raised."—J. Am. Pharm. Assoc., 9 (1920), 576. (Z. M. C.)

Blood Coagulants.—*The Standardization of.*—H. C. Hamilton reviews briefly the results of investigations on the coagulation of blood. Such coagulants are products from "blood platelets, from brain substance, from blood serum, from tissue extracts and from a combination of these." For testing blood derivatives like horse serum or coagulose the method devised measures the coagulation time of horse plasma. The blood is drawn into sodium citrate or oxalate solution and the mixture centrifuged. This separates the corpuscles and makes observation easier. Definite proportions of the coagulant and plasma are mixed and the time recorded when a firm clot is formed. A standard is selected, the maximum period during which the plasma may remain uncoagulated. A similar test is applicable to other coagulants if the decalcifying agent is eliminated and the blood plasma is kept fluid by care in drawing and by keeping it at low temperature. A series of loops in a platinum wire and means for keeping the film of blood in the loops fluid are the requisites. In Mr. Hamilton's experience, the apparatus is not adapted to use with dog's blood after hemostatic serum has been administered because the film of fibrin forms too quickly to measure the shortened time accurately. He used much the same method that he did for coagulose except that the action of serum was in vivo instead of in vitro. The femoral vein and carotid artery of a dog, anesthetized with chloretone, were opened and the blood drawn and observations taken at one minute intervals. Normal coagulation time was determined on samples drawn before injection. After injection of serum shortened time will usually appear in about fifteen minutes though it may be delayed for an hour. The standard for hemostatic serum is a shortening to one-third or one-fourth of normal time. A number of tables showing results of tests are given.—J. Am. Pharm. Assoc., 9 (1920), 119. (Z. M. C.)

Drug Analysis.—*Training In.*—C. O. Ewing points out some phases of the subject that are outstanding in Federal and commercial experience. It requires a broad general training because of the diversity of the work. Not only general, inorganic and organic chemistry are necessary but microscopy, materia medica, physics and bacteriology. Courses in drug assaying should be

designed to necessitate correlative studying in standard reference texts but it is most important to provide a maximum of actual laboratory practice. "The personal contact of a good laboratory instructor with the individual as the special problems arise is of more lasting benefit than general lectures." Graduates fail to appreciate the value of accurate and comprehensive notes taken at the time in a permanent notebook. Inexperienced analysts neglect "qualitative possibilities of nose and mouth." Comparative tests on standard samples are important. Long continued practice is more necessary for alkaloidal assays than others. Too much emphasis can hardly be placed on repetition of laboratory manipulations.—J. Am. Pharm. Assoc., 9 (1920), 586. (Z. M. C.)

Drug Assay Methods.—*Comparison of.*—Auenmueller summarizes the work of Tschirch and his pupils as to the best methods of drug assay; presenting the results of the study of the assays of practically all of the pharmacopœias of the world (including the U. S. P.) as well as certain commercial assay methods. In deciding upon the "best" method consideration was given to cost, amount of drug or preparation required, time consumed, exactness of results without hair-splitting and simplicity of apparatus required.

In the case of aconite, belladonna leaf, hyoscyamus, hydrastis, areca and cinchona and their preparations, the assay methods of the Swiss Pharmacopœia were found the best; for ipecac, the assay of the Hungarian Pharmacopœia was preferred; for nux vomica and for pomegranate, the Keller-Fromme assays were the best; for digitalis, the Wolter assay proved satisfactory; while for anthraquinone drugs, the Tschirch colorimetric assay is recommended. The paper gives details as to the three assays last mentioned.—Schweiz Apoth. Ztg., 58 (1920), 463, 451 and 465.

Drug Assays.—In an address before the New York German Apothecaries' Society, H. Engelhardt discussed at length the chemical and physiological assay of drugs.—D.-A. Apoth. Ztg., 41 (1920), 127.

Drugs.—*Relation Between Weight and Toxic Contents.*—In his article about the relation between the weight of colchicum seed and the amount of colchicine which they contain (see page 275). Grimme states that no literature is available on the subject. Rosenthaler, however, claims that the fact that specifically lighter drugs contain a higher percentage of active principles than specifically heavier drugs, has been known for a long time and that the Swiss Pharmacopœia for this reason excludes ergot of more than 25 mm. length. He further states that in many other drugs the amount of the active principles is in inverse proportion to the weight, such as in bitter almond, areca, physostigma, aconite and belladonna.—Pharm. Zent., 61 (1920), 629, through Bot. Abs. (H. E.)

Physiological Standardization.—Jules Cofman-Nicoresti states that although the wholesale drug houses of Great Britain make use of physiological assays in checking their preparations, the B. P. ignores all but the chemical standards. Every physiological laboratory has not only its own methods but its own individual standards. The author quotes Dixon, as saying: "There is great need for the establishment of physiological standards, especially of all of the official preparations of digitalis." The author would insist that all galenicals and preparations of the active constituents of the digitalis family bear a label containing the M. L. D. of the preparation.—Pharm. J., 104 (1920), 195. (F. H.)

DRUG HISTORY

Drug Names.—*Origin of.*—The origin of the name of a drug is often a means of determining the antiquity of the drug and tracing the route followed by the drug in reaching us. Thus if the name contains a Sanscrit root it may be assumed that India was its original home. The Greeks became acquainted with the various species of Citrus through the expeditions of Alexander to Persia. They heard there the Coptic-Arabic name "Gitre" and changed it into "kitpor." But gitre is compounded from the Chinese "Ku." The name of Citrus in China (changed into "chi" in India) and the affix "tra" (tree). The route followed by the Citrus species was accordingly China, India, Per-

sia, Arabia, Italy. Many illustrations similar to the foregoing are given by A. Tschirch in the paper, which should be read in its entirety.—Schweiz. Apoth. Ztg., through Pharm. Journ., 104 (1920), 500. (J. M. W.)

Pharmacognosy.—*Modern Use of the Word.*—E. J. Emanuel discussing the etymology and present use of the word "pharmacognosy" points out that while in most countries the word is used to designate the study of vegetable materia medica, in Greece, where the word is supposed to have originated it is applied to the study of all medicines, notably pharmaceutical preparations. He therefore proposes that for vegetable materia medica the word *drogognosy* be used.—Schweiz. Apoth. Ztg., 58 (1920), 129.

DRUG CURING

Drug Plant Fungi.—Emil Herrmann discusses the occurrence and effect of fungus growths on medicinal plants with the view of encouraging further observation and collection of more complete data on this important subject. He points out that practically any part of a plant yielding drugs may be affected by some kind of fungous growth but that leaves are most often affected and stems but rarely. The Umbelliferæ, Euphorbiaceæ, Labiatæ, Solanaceæ, Gentianæ, Compositæ, Rosaceæ and Ericaceæ all yield medicinal plant parts which are subject to fungous growths. The fact that certain plant parts contain chemical substances such as ethereal oils or poisonous principles does not in the slightest retard the growth of fungi upon them. The reason such drugs as are derived from the Scrophulariaceæ, Papilionaceæ and Polygonaceæ are not subject to fungous growths is only because the fungi do not affect those portions of the plants which are used as drugs. Other parts of these same plants may be considerably infested with fungous growths.

The particular fungi which affect drug plants are both saprophytic and parasitic in type. In the former class are included mucor, aspergillus and penicillium. In the latter class we find the chitridei, mycomycetes, mildews, including peronosporacei and perisporiinei, ustilaginei, uredinei, exobasidiaceæ and exoascaceæ.

The method of attack of these various fungi is explained and the possible harm to human beings taking drugs which have been infested with these growths is discussed. More information on this point is needed according to the author. Herrmann concludes that the rusts and true mildew are probably harmless as they have not been known to affect cattle. On the other hand *Aspergilus fumigatus* caused serious illness when administered to test animals. The inhalation of spores of fungi by collectors of certain drugs has been known to prove harmful. Blood is a good culture medium for pathogenic fungi and chewing or other contact of greens of various kinds is to be avoided as the fungous spores upon them may penetrate to the blood through an abrasion and cause serious disturbances. Animals have been known to succumb to such infections. Proper drying and inspection before use of all dried drugs is recommended to overcome the danger from this source.—Pharm. Zent., 61 (1920), 95. (R. P. F.)

Drug Eating Insect.—L. E. Sayre states that the common drug beetle is usually *Sitodrepa panicea, L.* These insects develop rapidly and cause great damage to drug stocks. The writer cites an interesting account of the inconveniences caused by these insects in the drug district of New York City in the late '80s.—Pharm. Era, 53 (1920), 7. (C. W. B.)

PERFUMERY MATERIAL

French Jasmin and Tuberose Crops.—*Trade Conditions.*—Bad weather seriously handicapped the delivery of flowers to the factories. The tuberose pomades, however, suffered less than the jasmin. The price for the flowers was more than fifty per cent. higher than the earlier very high prices. The labor cost more than ever. Another disturbing factor was the American lard which the manufacturers were obliged to use in place of the customary prime article from Italy and Serbia owing to the fact that those countries forbade its export. Notwithstanding these conditions the stocks were quickly exhausted at high prices. —Nat. Drug., 50 (1920), 195. (C. M. S.)

Perfumes and Toilet Preparations.—*Care and Presentation of.*—Victor Vivadou gives a fine discussion on the display, selling and storing of perfumes and toilet preparations. He states that electric light has a powerful effect on both the color and odor of perfumes and that temperature changes also exert a similar influence.—Ungerer's Bulletin, through Nat. Drug., 50 (1920), 37. (C. M. S.)

Perfume Fixatives.—*Selection and Application of.*—W. A. Peters calls attention to the need for discretion in the selection of fixatives and points out how they may best be applied.

The animal fixatives assume first rank and importance in dealing with the binding problem in perfume. Musk, ambergris and civet are old and tried friends.

Those of vegetable origin mentioned are tincture of orris root and aromatic gums.

Artificial musks, he states, enjoys a strength and timbre which make them inimitably valuable in intelligent use and vastly dangerous in the hands of the tyro.

Natural flower odors, by reason of their volatility have absolutely no fixative value while heavy pure fixatives like artificial musks in excessive quantities eat up the delicate floral odor and produce a metallic and extremely unsatisfactory finished result.

By way of conclusion he states "Treat the fixative with appreciative consideration, but keep it in the background. It is necessary but not ornamental."—Drug. Circ., 64 (1920), 454. (L. N. B.)

Perfumes.—*Their Manufacture Is an Art.*—Burton T. Bush points out that the preparation of finished perfumes is an art requiring a high degree of artistic sense and special ability. The demand for perfumes as such and also for scenting of soaps, talcums, etc., is so great that it cannot be filled by natural essences alone, therefore, blended perfumes generally contain natural essences and synthetic perfume substances. Eight tons of ionone or synthetic essence of violet was used during one year, close seconds to ionone were phenyl-ethyl alcohol, a synthetic oil of rose odor, and benzoyl acetate, which resembles jasmine. Other synthetic products have characteristic agreeable

odors of their own and are used to "tint" other essences or act as the base of new perfumes. Mr. Bush described Grasse, the center of flower industry of France; here much attention is given to the subject of flower raising for the manufacture of perfume; all horticulture and technical problems are handled in a modern scientific manner. Old and new methods of extraction are still in operation; by the old method, the oils are extracted from the flowers by maceration or enfleurage; by the new, extractions are made in autoclaves with suitable solvents, usually especially purified petroleum ether. The resulting concentrates are extracted with alcohol; these solutions are then blended into the finished perfumes.—Pharm. Era, 53 (1920), 372. (M. O'C. D.)

"The Portfolio and the Perfumes."—This is a true story, the scene of which is laid in a capital of the Orient and deals with the important rôle perfumes, creams, face lotions and such creations may play in the subtle art of diplomacy. The ladies of the Embassy often used the portfolio for the most urgent needs of their patriotic country. As ill luck would have it, one very respectable looking trunk came to grief, spilling before the startled bystanders, a jumbled mass of perfumes, creams, powders and what not in place of the expected State documents. The owner of this ill-fated trunk was severely censured, but it may still be a question in many minds if these pretty vanities do not sometimes in their way play quite a part in the development of nations.—Farmacia, through Pharm. Era., 53 (1920), 298. (J. M. W.)

MISCELLANEOUS

Botanical Garden.—*The Old Linnean.*—The little botanical garden which was the pride of Linnæus, and famous in his time, is to be restored, to its original condition by the Swedish Linnean Society. It was abandoned on the establishment of the new garden more than a hundred years ago, and has been allowed to fall into decay. The conservatories were later used as an archæological museum; and Linnæus's house was occupied by the Director of Music of the University. The garden is now being restored to its original plan, and will be planted only with species grown there by Linnæus himself. The work has been

partly completed, and the garden was opened to the public last May. Linnæus's house where he died will be converted into a memorial museum, which will be supplementary to his country house at Hammarby, familiar to several British botanists.—Kew Bulletin, through Pharm. J., 105 (1920), 445.

Flies.—*Sense Reaction of*—Olive C. Lodge added various substances to baits, consisting of casein, brown sugar, and banana. The species of diptera experimented with were the common house-fly, *Fannia calicularis, F. scalaris*, and the four commonest blowflies. The sexes were generally equally attracted, but more females came to casein treated with a few drops of ammonia. Ammonia alone was not attractive. There is a general similarity of predilection among the flies tested. Nothing was found which would attract, or repel, all the flies which came near it. Mineral and tar oils were most repellent. Sodium iodate was the best poison, but is too costly for general use. Flowering plants are not generally attractive, but blowflies show a preference for golden rod. No color preferences in selecting food were noted. The optimum temperature for the house-fly is 36 44°, the maximum 55 58°, the minimum 10-30°. Curiosity plays a large part in causing flies to seek baits, but the sense of smell, and to some extent sight, are also concerned. Flies which had their eyes covered with varnish behaved abnormally. Removal of the antennæ did not affect the powers of selecting food.—Bull. Entomol. Sci., through Pharm. J., 104 (1920), 300.

Medicine Makers.—*Shakers as.*—George Niles Hoffman's interesting paper on the Columbia County medicine growers, embodies a description of their crude apparatus for the manufacture of the extracts.

The growers were mainly of the religious class known as the Shakers. They upheld a new and eccentric religion introduced into this country by "Mother Ann" who settled in the village of New Lebanon in 1870. The settlement formed at that time remains as the Shaker Village of today.—Pharm. Era., 53 (1920), 197. (F. H.)

Pancake Flour.—Stockholm officials report upon the examination of "Aunt Jemima's Pancake Flour." It would seem that

the examination had been directed as a result of advertising which seemed to the authorities to be exaggerated in nature. The package purchased weighed 581 grammes net and was sold for 2 Swedish Crowns. Von Stuss, who directed the examination reports the presence of barley, buckwheat, maize and wheat flour, the latter in only small quantity. About 5 per cent. of baking powder was also found present. The authorities rendered the opinion that the article sold did not meet the requirements of the law, quite independent of the fact that the price at which it is offered for sale and sold, is exhorbitant.—Svensk. farm. Tidskrift., 24 (1920), 321. (G. C. D.)

B—VEGETABLE DRUGS

American Crude Drugs.—*Analysis of 330.*—Clevenger and Ewing have performed a distinct service and have produced a monumental work in the report of their analyses of 330 American drugs. Their findings which are presented in tabulated form must be consulted in the original articles.—J. Am. Pharm. Assoc., 8 (1919), 1029 and 9 (1920), 15.

Acacia.—*Argentine.*—A new source for gum arabic is indicated in the report of Trade Commissioner Smith, who has forwarded to the Bureau of Foreign and Domestic Commerce samples of gum arabic which were collected in the forests of Argentina. It is stated that ten tons of the product could be prepared for shipment within a month and that shipments of approximately the same quantity could be made monthly thereafter. American importers are urged to interest themselves in this proposition. At present no information is available as to how the product compares with gum arabic from other sources.—Pharm. Era, 53 (1920), 362.

Acacia.—*Botanical Function of the Gum.*—From observations made on the spot, in Kordofan and Senegal, E. Perrot considers that the main function of the gum formed in the interior of *Acacia Verek* and other species of Acacia is to preserve for the plant the moisture that is necessary to keep it alive during the periods of extreme drought which prevails from the month of

December until April. The cicatrization of wounds by the exuding gum is considered to be only of secondary importance. The theory that gum is mainly a reserve of moisture is supported by the following facts. Gum is exuded only during the periods of extreme dryness. Trees situated in small depressions or where the subsoil contains a trace of moisture yield practically no gum. The lightest rainfall appearing after the trees are tapped artificially entirely arrests the flow of gum. Incidentally, it is noted that the method of tapping the trees by making incisions in the bark, produces a greatly increased yield of gum, and does not harmfully affect the trees. This gum, also, is of far better quality than that exuded spontaneously from cracks or from the punctures caused by insects. This tapping method, which is widely carried out in Egyptian Kordofan, is unknown in French Senegal, where it should certainly be followed.—Compt. rend., through Pharm. J., 105 (1920), 510.

Acacia.—*Production of.*—In describing a specimen of *Acacia Senegal* with the tears of gum in situ, H. C. Greenish gives a brief account of the collection of this article. The tree occurs in the Anglo-Egyptian Sudan, forming open forests and attaining a height of 15-20 feet. These forests are owned by Arab chiefs and but little is obtained from unowned forests. The trees are tapped in February or March and the season ends in May. The tapping operation consists in making a transverse incision and tearing off a strip of bark about 2 or 3 feet in length by one to three inches in width. The gum exudes and gradually hardens. After collection, the tears are bleached by sun. The gummosis is undoubtedly a pathological process.—Pharm. J., 105 (1920), 265. (C. W. B.)

Acacia.—*Properties of.*—P. Enrico discusses the various qualities of acacia in the Italian market. He advises the use in pharmacy of Kordofan gum only. He prepares *mucilage of acacia* by circulatory solution of the gum in recently boiled water and upon the completion of the solution, it should be sterilized by letting its container stay in boiling water for one-half hour. If the container is then closed with a piece of filter paper, the mucilage will keep for a long time.

The author makes his emulsions of fixed oils by placing in a mortar 36 parts of mucilage of acacia adding it little by little 100 parts of the oil followed by 24 parts of the diluting liquid. —Boll. chim. farm., through Pharm. Zent., 61 (1920), 657.

Acacia and Senna.—Henry C. Greenish in quoting from a report by Perrot and Alland of the Interministerial Committee of Medicinal Plants, emphasizes the importance of *Acacia verek* as a gum tree.

The habit of the plant in relation to the gum is aptly stated as are the suggestions relative to the commercial output.

The three varieties of *senna* widely distributed in the Anglo-Egyptian Sudan are *Cassia acutifolia, C. augustifolia,* and *C. obovata.* The leaves of the cultivated senna are less rigid, thinner, narrower and more elongated than the wild of the same species.—A number of photographs accompany the report.—Pharm. J., 105 (1920), 488. (F. H.)

Aconite.—*Assay of Preparations of.*—Chappel and Allport find that the B. P. method for the assay of tincture and liniment of aconite, in which the preparations are evaporated to dryness, the residue taken up in N/50 sulphuric acid and this solution filtered, is tedious and slow. They recommend the following modification: To 15 mils of liniment or 100 mils of tincture evaporated to remove most of the alcohol, add 5 mils 10 per cent. sulphuric acid diluted with 20 mils water and shake the mixture with two portions of petroleum ether in a separatory funnel. The petroleum ether extracts are mixed, rinsed twice with water and the washings added to the acid liquid. The latter is made alkaline with ammonia and extracted four times with ether. After washing, the ethereal extracts are evaporated to dryness and titrated in the usual manner.—Pharm. J., 105 (1920), 94. (C. W. B.)

Adonis Vernalis.—*Pharmacology of.*—J. M. Schmidt supplements the chemical analysis of odonis leaves by Heyl, Hart and Schmidt (see YEAR BOOK, 1918, 221) with a paper on its pharmacological action. He finds that *Adonis vernalis* stimulates the heart in a manner very similar to digitalis; that it produces variations in blood pressure characterized by a rise, if large doses are administered, or by no pressure effect if the doses are

relatively small; that the changes in the pressure are caused mainly by the action of the drug upon the blood vessels; that it is less irritating than digitalis and possesses less tendency to produce gastric disturbances; and that it possesses approximately the same strength as digitalis preparations made according to the official directions for a tincture or fluidextract.

The article has a bibliography of 12 references and is illustrated with 10 cardiograph tracings.—Am. J. Pharm., 92 (1920), 702.

Aleurites Fordii.—*Possible Cultivation in Germany.*—F. Fritz points out the possible cultivation of *Aleurites Fordii*, the China wood tree, in certain sections of Germany, such as the Lüneberg Heath. It is a handsome tree that grows quite well in cold climates, while its seeds contain the oil that forms an important part of Chinese exports.—Chem. Umschau, through Pharm. Zent., 61 (1920), 400.

Agar.—*Method of Preparation.*—Hiroshi Nakamura, describes in considerable detail the manner of preparing agar agar for the market. The supply comes from marine algæ found on the Asiatic coasts of China and Japan. Because of the increasing use of agar in medicine and the industries, it is only a question of time until the Asiatic supply will fail to equal the demand. Mr. Nakamura is of the opinion that the United States must be the future source and that our botanists and chemists should be encouraged to make a thorough study of the possibilities.—Bull. Pharm., 34 (1920), 279. (C. M. S.)

Aloes.—*Oxidation of Constituents of.*—E. Seel separated the products obtained on the oxidation aloin, aloëtin and the crude resin of aloes with persulphates and peroxides and investigated their pharmacological action.—Arch. Pharm., through J. Soc. Chem. Ind., 39 (1920), 81 A.

Aloes.—*Relative Activity of the Water-soluble and Alcohol-soluble Portions.*—G. E. E'we found that average physiologic tests on dogs of approximately the same size indicated that the water-insoluble portion had to be employed in a quantity 30 times as great as the water-soluble portion to produce the same laxative effect.—Proc. Penna. Pharm. Assoc., 43 (1920), 251. (L. S.)

Amber.—Brand discusses interestingly the ancient legends concerning the origin of amber, the commercial history of the substance and its properties and grades and quality.—Der Mörser, through D-A. Apoth. Ztg., 40 (1920), 142.

Apples.—*Origin of Cider.*—A. Chevalier discusses the history of cider production in France. Although this is an important industry in North-Western France, the value of which amounts to 500 million francs in a good season, the origin of the cider apple appears to be doubtful. It is stated by authorities that there are several thousand varieties of cider apples grown in France, but the majority of these are of little value, and should be eliminated from the orchards. Until the last century all apples were traced to *Malus communis,* a European species. It seems in the light of present knowledge that *Malus communis* should be split into four species: *M. acerba, M. præcox, M. dasyphylla,* and *M. prunifolia.* The species *M. acerba,* the crab apple, was created by Mérat in 1815. DeCandolle, repeating an error of Mérat, attributed the source of the cider apple to this species, and that of the eating apple to *M. dasyphylla.* Cider was first undoubtedly made from wild crab apples. St. Guénolé, who lived at Landrevec from A. D. 464 to 532, is said to have drunk water and the juice of wild apples. The monk Robert Tortaire, accustomed to drink wine, records at the beginning of the twelfth century that he was offered by Bayeux cider made with the juice of sour apples, which was very unpalatable. It is not until the end of the eleventh century that any record is found of the use of cider of the quality drunk in Normandy. Documents show that from that time to the sixteenth century graftings of apples were imported from Biscaye into Normandy. The species thus introduced was certainly *Malus dasyphylla,* originating in Armenia and Turkestan, where it still grows wild. It spread by culture all over the Mediterranean coasts, and was undoubtedly one source, if not the chief, of the Normandy apples. *M. præcox,* originating from Russia, is the Paradise apple, used by pomiculturists at the present day mainly as a grafting stock, the familiar "paradise" stock. *M. prunifolia* originated from Central Asia, and is spread by cultivation through Siberia and Russia on one side, and to China and Japan on the other.

These four species are transformed by culture and hybridizing, and have furnished the bulk of the cultivated apples of the present day; and to them, and not to *Malus acerba* alone, the origin of the cider apple must be attributed.—Compt. rend., through Pharm. J., 105 (1920), 476.

Apples.—*The Odorous Constituents of.*—Power and Chestnut call attention to the fact that many ripe fruits possess characteristic odors that it is somewhat remarkable that so little information has been recorded respecting the chemical nature of the substances to which these odorous properties are due. This deficiency of knowledge may, however, be attributed to the extremely small proportion in which such constituents are usually present to their more or less complex character, and to the constituent difficulties attending their separatoin or identification. The respective odorous substances have commonly been regarded as esters and a number of artificially prepared compounds of this class have indeed been given names which indicate their resemblance in odor to certain fruits, such as "apple oil" for amyl valerate, "pear oil" for amyl acetate, and "pineapple oil" for ethyl butyrate.

Power and Chestnut's work shows that the odorous constituents of apples have been found to consist essentially of the amyl esters of formic, acetic and caproic acids, with a very small amount of the caprylic ester and a considerable proportion of acetaldehyde. While amyl valerianate has been commonly called "apple oil" no evidence has been obtained by the authors of its presence in apples.—J. Am. Chem. Soc., 42 (1920), 1509. (J. L. M.)

Araliaceæ.—*Chlorogenic Acid of.*—According to K. Gorter caffetannic acid does not seem to exist in plants, but these contain chlorogenic acid and coffalic acid. The reactions generally given for the identification of coffee-tannic acid are due to chlorogenic acid. This acid is broken up by alkali into caffetannic acid and cinchotannic acid according to the equation:

$$C_{32}H_{38}O_{19} + H_2O = 2C_9H_8O_4 + 2C_7H_{12}O_6.$$

Gorter examined 230 East-Indian plants for chlorogenic acid and found that the acid is very frequently met with in the vegetable

kingdom and further that it is present in all the plants of the genus Araliaceæ. The method for detecting the acid consists in refluxing 10 grammes of the freshly minced leaves with 50 mils of 6 per cent. hydrochloric acid for one hour and, after allowing to cool, filtering the mixture and shaking the filtrate with 15 mils of ether. The ethereal solution is then purified by shaking with diluted sodium bicarbonate solution followed by two portions of water and is then shaken with a mixture of 4 mils of water and one drop of 5 per cent. ferric chloride solution. A more or less deep-violet color is produced within 1 or 2 minutes when chlorogenic acid is present and the ether is colored light yellow. A. W. van der Haar examined various species of ivy and found only two to contain small quantities of the acid. These results do not agree at all with those of Gorter, who, as already mentioned, claims that all Araliaceæ contain chlorogenic acid, but the absence of the acid in the species examined by v. d. H. may be due to the fact that these plants had grown in Holland and had lacked the tropical heat in their development. He also advises increasing the amount of ether in Gorter's test and using an equal volume of the solvent for shaking out the aqueous liquid.—Pharm. Weekbl., 57 (1920), 194. (H. E.)

Arnica.—*Adulterants of.*—C. Wimmer reports that the following roots and rhizomes were found as adulterants of arnica as sold in Austria: *Eupatorium cannabinum, Potentilla erecta, Geum ubanum, Cynanchum vincetoxicum, Succisa pratensis, Teucrium fontanum, Thymus* species, *Gallium* species, *Fumana procumbens, Hieracium auricula, Centaurium minus, Potentilla* species and *Veratrum album.* Wimmer also mentions five other adulterants mentioned in the literature, but not found by him in arnica samples. —Z. œsterr. Apoth. Ver., through Pharm. Ztg., 65 (1920), 470.

Ballota Fœtida.—*Antispasmodic Action of.*—At a meeting of the Société de Therapeutique, H. Leclerc spoke of the excellent effects he obtained from the use of this herb. He used the freshly expressed juice in tablespoonful doses, the infusion of the flowering tops and the tincture of the same [strength not stated.—Ed.]. He also found it of value in croup.—J. pharm. chim., 21 (1920), 71.

Balsam of Peru.—*Preparation of.*—Balsam of Peru is obtained from a tree (*Toluifera Pereira*), which grows wild in the forests of San Salvador, Central America. The trees mostly occur in groups which are usually enclosed, the owner building his hut in the vicinity. The method of collection is briefly as follows: The tree is beaten about a foot from the ground and over a surface of 6 to 10 inches, with a round stone or other blunt instrument, until the outer bark is detached and the inner bark left bare. The exposed bark is covered with a piece of woolen cloth to absorb the exudate. The exposed surface is then heated by means of burning torches, whereby a copious flow of balsamic resin is induced, which is also collected on cloths or rags. When the exudation has ceased a cut is made in the exposed surface, which causes another flow of exudation. About a week later the inner bark is removed and the stem begins to exude the balsam. The balsam, therefore, is not, strictly speaking, a natural exudation, but is better described as a pathological product, produced by the tree as a result of external injury. The saturated rags are afterwards boiled with water for several hours, when the balsam sinks to the bottom of the vessel and the impurities which float are removed. The water is then decanted, and the balsam poured into gourds and other receptacles for the market. The next year the trees are again tapped, another portion of the stem being selected, and for many years the trees continue to yield balsam. It is therefore not surprising that the product is somewhat variable, as it is scarcely to be expected that the exudation from the same trees in different years will be of uniform composition. Again, it is not impossible that the exudation of other trees may find its way into the balsam either through ignorance or as a deliberate adulterant. The analyst has therefore to depend on the physical and chemical characters in order to form an opinion as to the purity of a given sample. The cinnamein-content is undoubtedly the best guide of the value of a sample, but it may be increased by the deliberate addition of artificial esters of benzoic acid. The saponification value of the extracted cinnamein varies from 229 to 257 according to the proportions of the constituent esters, cinnamein not being a substance of definite composition. The limits fixed by the U. S. P. (235 to 238) are too narrow.

the B. P. giving "not less than 235," which is more correct.—Perf. Ess. Oil Rec., through Pharm. Era, 53 (1920), 210.

Balsam of Peru.—*Tests for Adulterations.*—L van Itallie examined a sample of Peru balsam which had the sp. g. 1.146, an acid number 48.8 and a saponification value 356. It contained 70 per cent. of cinnamein, which had the saponification number 382. Since the saponification numbers of both the balsam and the cinnamein were too high and the acid value of the balsam was too low, adulteration was suspected. It was found that the balsam contained phthalic acid dimethylester. When to one drop of the balsam about 0.1 gramme of resorcinol and 10 drops of sulphuric acid were added and when the mixture was heated almost to boiling, fluorescein was formed. The balsam also did not answer Dieterich's reaction for pure balsam. One-half to 1 gramme of the balsam was dissolved in ether, the ethereal solution was shaken out with 2 per cent. caustic soda solution and from the alkaline solution the resins were precipitated with acid. When the resins were dissolved in ether and when the ethereal solution was carefully poured upon concentrated sulphuric acid a blue colored ring was produced at the zone of contact of the liquids. With genuine balsam no colored zone is produced. A synthetic balsam had the following constants: acid number 48.1, saponification number 220.4, cinnamein 64 per cent. with a saponification value 254. The balsam gave the fluorescein reaction. Benzoyl benzoate which might be used for adulteration can also be detected by the fluorescein reaction.—Pharm. Weekb., 57 (1920), 1383.

Barberry.—*Constituents of Japanese.*—The fruit of *Berberis Thunbergii* was grown on the campus of Cornell College as part of the ornamental shrubbery. The small red berries, gathered in the autumn of 1919, were dried by O. Mason in an oven at moderate temperature. There was found 39.5 per cent. of sugar, ash 4.6 per cent., nitrogen 2.3 per cent., a fixed oil and citric, malic and tartaric acids (percentage not stated). The fixed oil, obtained after two weeks reflux extraction with ether, had a dirty green appearance due to chlorophyll. This was removed by heating for twelve hours with bone black when an amber colored oil, resembling olive oil in appearance and odor, was

obtained. This oil having a specific gravity of 0.9312 and 0.9290 boiled at 148° and became semi-solid at —15°. The saponification value (possible only after long heating) was 235. No separation occurred upon cooling. Analysis of the ash is given. —Chem. News, 121 (1920), 61. (J. H.)

Belladonna.—*Practical Cultivation of.*—Kilmer and Smith, in a 9 page paper describe the cultivation of belladonna at New Brunswick, N. J. Beginning operations in 1900, during 1919, they obtained successful crops from a 60 acre field. After pointing out that the aim of the belladonna planter should be service rather than large profits, the authors discuss the following factors to successful cultivation: climate and soil, germinating the seed, planting the seedlings, harvesting, yield and standards for the herb, leaves and root.

As to yield, 1,000 second year plants yielded 1,177 pounds of herb, containing 0.891 pound of alkaloids; 1 000 first year seedlings (potted plants) yielded 527 pounds of herb, containing 0.313 pound of alkaloid and 1,000 first year seedlings (cold-frame plants) yielded 534 pounds of herb, containing 0.289 pound of alkaloid.

The authors recommend the inclusion in U. S. P. X of belladonna herb, since their investigations show that belladonna stems contain as much alkaloid as does the leaves.—Am. J. Pharm., 92 (1920), 620.

Bitter Almond.—*Variations in Amygdalin Content of.*—L. Rosenthaler discusses variations in amygdalin content of bitter almonds and gives several pages of statistics showing the results of these examinations. The alkaloidal content of *calabar beans* is then discussed in the same way and similar tabulations are provided.—Ber. Dtsch. Pharm. Ges., 30 (192L), 13. (H. H. S.)

Camphor.—*Burmese.*—It is claimed that *Blumea grandis,* a weed, six to eight feet high, growing very abundantly on cut over forest lands in Tavoy, Burma, yields a camphor identical with Chinese camphor. Steps are being taken by the Burma Forest Department to determine the commercial possibility of

camphor from this source.—Chem. & Drug., 92 (1920), 425, through Bot. Abs. (E. N. G.)

Camphor.—*Examination of Crude Chinese.*—E. R. Dovey determines the moisture by the carbide method, allowing 3 hours for the evolution of the gas. To determine water and oil, 100 grammes of the sample are pressed between layers of lint in a steel cylinder, 2 in. in diam. and 6 in. deep, having a perforated bottom plate and a piston worked by a strong screw thread; after 15 minutes, the cake is removed and weighed. The moisture content of the pressed cake is determined, and from this are found the amounts of expressed water and oil. The total quantity of oil is calculated on the assumption that the residual water and oil in the pressed cake are in the same proportion as they are in the expressed liquid.—Analyst., through J. Soc. Chem. Ind., 39 (1920), 526A.

Camphor.—*Production in Florida.*—Commercial and governmental agencies are working toward the establishment of a camphor industry of sufficient extent to supply the demand for this substance. Emma Gary Wallace notes that a tract of 12,000 acres at Waller, Fla., has been purchased by commercial interests for the purpose of camphor cultivation. The Department of Agriculture farm of 3,000 acres near Palatka, Fla., established 36 years ago, has demonstrated the possibilities of this industry. The camphor tree lives to a great age and in the Orient they are considered so valuable that ownership in a single tree is often vested in several parties. In China the trees cannot be sold without official permission. Synthetic camphor cannot compete with the natural in quality and quantity.—Pharm. Era, 53 (1920), 261. (C. W. B.)

Camphor.—*Production in India.*—Simonsen and Ghose record the results of experiments to determine the camphor content of various parts of *Cinnamomum camphora* grown in the Indian Empire. Twigs and leaves were distilled to ascertain whether the camphor content in these parts was sufficient to warrant their use as a source of the substance in preference to the wood. Operations were performed on a "semi-large" scale using a still

in which at least portions of the camphor and oil could be collected separately. From the tabulations accompanying the article it is apparent that distillation of camphor and camphor oil from the leaves of coppiced trees could be profitably undertaken although questions of how frequently the leaves should be gathered and acreage yields should first be determined. The percentage of camphor in the leaves is at least equal that in the wood and the plant is not sacrificed in obtaining the product. Distillation of the twigs gives little promise of commercial possibilities. Slight differences are noted in the camphor oil obtained from different parts of the plant. The leaf oil contains alpha-pinene, dipentene, cineol, terpineol, caryophyllene and traces of cadinene. The oil from the twigs is similar excepting the absence of cineol. The wood oil, among other constituents, contains safrol but cineol is absent. Extensive data regarding the chemical characters of the camphor oil from the different parts of the tree form a part of this contribution.—J. Soc. Chem. Ind., 39 (1920), 296T. (C. W. B.)

Camphor.—*Production in the British Empire.*—A. Nutting states that the supply of camphor produced in Formosa is diminishing due to the destruction of the trees. In Ceylon and Trinidad, the camphor is obtained from the fresh prunings. While the quantity produced thus far in the British colonies is not large "the successful cultivation of camphor within the British Empire is no longer doubtful." The article states that the world consumption of camphor now amounts to 10,000,000 pounds per annum.—Comm. Rept., through Am. J. Pharm., 92 (1920), 590.

Camphor.—*Production in the Foochow District.*—E. B. Price points out the promising aspects of the production of camphor in China. He states that the local Foochow dealers have 80,000 pounds of camphor in stock, while the Government Camphor Bureau holds 27,000 pounds. An indication of increase in production is shown by the following figures of exportation of camphor from Foochow: 1918, 56,533 pounds; 1919, 931,600 pounds; first quarter of 1920, 427,066 pounds.

marketing and the government camphor bureau.—Comm. Rept., through Am. J. Pharm., 92 (1920), 923.

The article describes means of distillation and transportation,

Camphor.—*Production in South China.*—While Japan largely controls the camphor industry in the Orient there are some districts in China where the production of this article is free from outside influence. The Kwangtung Province, in South China, has become quite a producer of camphor, most of this being brought down the North and West Rivers. Many camphor trees are found in the vicinity of Wushek, according to an importer who recently returned from a trip through the Orient, and not only is camphor extracted there in a considerable quantity, but the large trees are cut up for planking and used for a variety of purposes. Camphor wood is used in the making of trunks, furniture and the large street shop signs that are a feature of Chinese cities.

Very primitive devices are used in the extraction of camphor and when it is desired to move a still to a more suitable location the work is carried on at a small expense. Usually the plant is housed under a simple matshed and consists of four or five native stoves of a large type, with no regular flue, upon which a simple still is placed. The still consists of a cauldron, such as is found in most homes in China, surmounted by a tall wooden structure that looks very much like a vase. There is an opening in the top of this into which the camphor wood chips are thrown, with a second opening a little lower down into which water is poured.

From the top of the vat runs a large bamboo pipe which conveys the vapor to the side of a small tank near the rest of the plant. In this tank are placed several tubs, with no bottoms, and movable lids, and the vapor is led through these in series, all the tubes being of bamboo. The camphor is deposited in the tubs by contact with cold water, the first one containing camphor oil, with the others giving up flowers of camphor, with a varying proportion of oil. The still is kept going incessantly and the tubs are removed every few days and replaced with empty ones.

The camphor produced is fairly white, but contains considerable oil and is placed in a linen bag and allowed to drain, but even when sold contains oil in varying quantities. The natives are paid about $1.50 a catty for the product, the catty being the Chinese pound equal to about one and one third pounds avoirdupois.

Americans who have witnessed the process of distillation in the Kwantung Province express the opinion that the vapor that is finally released contains considerable recoverable camphor and that the chips withdrawn from the retort lack much of having their full properties extracted. It is believed that with modern grinding machinery and distilling apparatus the output of camphor could be increased to a marked degree, but whether its introduction, with the skilled labor necessary, would be a paying proposition, is another matter.—Pharm. Era, 53 (1920), 235.

Camphor Seed.—*Pulping Increases Their Fertility.*—The development of the camphor industry in Florida, and in other countries, has been checked by the low percentage of seeds which produced useful seedlings, only about ten per cent. being the average. Indications had been obtained that removal of the pulp increased the germinating power of the seeds. Experiments of G. A. Russell now fully establish this. Seeds from which the pulp had been removed previous to sowing not only germinated more quickly, but much more freely. The percentage of seedlings rose from 9.4 with the normal seeds to 60.1 with pulp-free seeds. Other methods of treating the seeds were also tried, but none gave results in any way comparable to those obtained by pulping. It was noted that seeds which ripened earlier in the season and fell to the ground, gave a lower percentage of seeding plants than those which matured later and remained attached to the shrubs.—J. Agric. Research, through Pharm. J., 194 (1920), 419.

Candelilla Wax.—*Production and Properties of.*—L. Farcy discusses this Mexican wax, obtained by steeping the fleshly phyllodia of *Pedilanthus pavonis* in boiling water and collecting the wax which floats to the surface. This wax has the density 0.995 to 0.999; melting point, 83.5°; free acid, 4.2 to 5.4; total acid,

79 to 82; iodine number, 7.23 to 9.14; hydrocarbons 1.04 to 1.62 per cent.—Ann. falsif., through J. pharm. chim., *22* (1920), 174.

Candleweed.—*Rubber from.*—A plant in Arizona is producing a ton of crude rubber per day from the *ocotillo,* or candleweed, which grows wild in great abundance in that part of the country. One ton of the weed yields 200 pounds of gum and 90 pounds of a marketable tarry substance. The gum is said to lend itself well to vulcanization and to be suited for the various uses to which rubber is put.—J. Soc. Chem. Ind., 39 (1920), 337 R.

Cardamom.—*Indian.*—The cardamoms which enter into the export trade of India are obtained from the capsules of a perennial herb, *Elettaria cardamomum,* indigenous to the humid forests of Western and Southern India, where it is extensively cultivated at elevations from 500 to 5,000 feet. There are about 20,000 acres under cardamoms in the Madras Presidency (chiefly the Malabar and Madura districts), Mysore, Coorg, and Travancore, and 5,000 acres in Bombay (chiefly in the Kanara district). The normal outturn per acre varies from 50 to 250 pounds, and a great deal is consumed in India as well as considerable imports from Ceylon. Two varieties of cardamoms are recognized. Mysore, round smooth-skinned capsules and Malabar, long, rough-grained capsules, known as shorts and short longs. The former are preferred and command a higher price. Cardamoms are chiefly used for medicinal purposes, for flavoring cakes and liquors, and as an ingredient of German sausages. The essential oil used medicinally as a carminative, and in connection with perfumery in France and the United States of America, is derived not from the Malabar or Mysore cardamom, but from the so-called "greater cardamom" of Nepaul (*Amomum subulatum*). The capsules which ripen in September and October are hand-gathered and sent down to the ports, and while some are dried and bleached in the sun before export, better qualities are generally cured more elaborately. After being sulphur-bleached the stalk end of each pod is carefully clipped, and the capsules are then graded. Such cardamoms at the present time fetch in London about double the price per

pound of the less carefully prepared pods. In some quarters there has been an increased demand lately for dried green cardamoms which are supposed to be more highly flavored than the bleached cardamoms. Cardamoms which are packed for export from Madras ports in cases of 1 cwt. and bags of 126 or 140 pounds are usually consigned for sale to London auction rooms.—Ind. & East Drug., through Pharm. Era, 53 (1920), 365.

Cascarilla Bark.—*Mineral Constituents of.*—Kunz-Krause finds that the bark of *Croton eluteria* contains 6.26 per cent. of moisture, 4.06 to 4.34 per cent. of water-soluble extractive and that it yields 11.11 to 11.85 per cent. of ash. This ash contains potassium chloride, sodium sulphate, calcium carbonate, iron and aluminum phosphates and silicic oxide. The chlorine content of the ash (4.36%) is quite high and it is therefore proper to consider cascarilla bark as a "chloride drug." Extract of cascarilla Pharm. Germ. contains as much as 15 per cent. of potassium chloride.—Pharm. Ztg., 65 (1920), 885.

Cassaba and Honey Dew Melons.—H. W. Youngken states that owing to the scant references on the melons available he was prompted to undertake the investigation of their origin, history, structure and chemical constituents. The melons belong to the group designated by Bailey in his Standard Cyclopedia of Horticulture, as the inodorous variety of *Cucumis melo.* The species possesses an extraordinary number of varieties and breeds, some of which are as follows: canteloupes, melons, brodes, sucrins, melons d'hiver, serpents, formede concombre, Chito, Dudain, rouges d' Perse and sauvages. Each group contains varieties of nearly allied races. Many were known to ancients and they grew wild from the west coast of Africa to India, gradually becoming known farther north and finally being distributed over Europe and Asia from whence the seeds were shipped to America. The Cassaba melon gets its name from the town Kassaba about fifteen or twenty miles from Smyrna. It was from there that it was introduced to this country in 1878. The Honey Dew melon is an old South of France variety of the winter melon, renamed. It is now grown extensively in Colorado. The article is illustrated with numerous cuts show-

ing the botanical structure of both melons. The following chemical data is from an analysis of the fruits made by J. W. E. Harrison and Chas. H. LaWall.

	Honey Dew Melon	Cassaba Melon
Total weight	1388.3 Gms.	3316.9 Gms.
Wt. of seeds and placenta	87. Gms.	293. Gms.
Wt. of rind	680. Gms.	1360. Gms.
Total refuse	767.4 Gms.	1653. Gms.
Amount of edible portion	45%	50%
Composition of pulp—		
Moisture	90.52%	89.05%
Ash	.52%	.80%
Crude fibre	.36%	.54%
Protein	.51%	1.21%
Reducing sugar before inversion	2.05%	1.87%
Reducing sugar after inversion	4.04%	2.76%
Fat	None	None

—Proc. Penn. Phar. Assoc., 43 (1920), 202. (L. S.)

Castor Oil Plant.—*American Cultivation a Possibility.*—J. L. Lemberger discusses this topic, pointing out that the bean can be planted the same as corn, about the same time, and cultivated in the same manner. Thirteen plants produced fifty-two bunches of fully developed burrs each containing three beans. The yield weighed two and three-quarter pounds and measured about one-sixteenth of a bushel. A bushel would weigh about 56 pounds which at 6½ cents a pound would be $3.64 per bushel. Corn at the time these quotations were obtained was worth $2.10 per bushel.—Proc. Penna. Pharm. Assoc., 43 (1920), 255. (L. S.)

Castor Oil Plant.—*Cultivation in Morocco.*—C. Chaveau urges the cultivation of the castor oil plant in Morocco. The plant is not particular as to soil provided it contains lime, and is deep, porous, and well-drained; it soon exhausts the ground, and after six or seven years it must be transferred elsewhere. The seeds are first soaked for a few hours in tepid water, and then sown 6 feet apart each way. The variety with large seeds

grows about 9 to 12 feet high, and bears numerous panicles of about fifty to sixty capsules, each containing three seeds. The variety with small seeds bears fewer panicles, but the oil is better suited for medicinal use. The chief uses of the oil are, however, as a lubricant, for making Turkey red oil, and for tanning. There is certain to be a large market for the produce. —Ann. Chim. Analyt., through Pharm. J., 104 (1920), 250.

Castor Oil Plant.—*Cultivation in New South Wales.*—An interesting account of experiments and experiences in the cultivation and testing of seeds of the castor oil plant was given by Messrs. E. Chiel and A. R. Penfold at a recent meeting in Sydney of the industrial section of the Royal Society. Two distinct forms of the plant are found naturalized in New South Wales, and, in addition, there are at least four varieties under cultivation. The oil from the seeds grown in New South Wales was found to average 50 per cent. by weight of the seeds, and the analytical figures showed it to be useful for all such purposes as lubrication, leather dressing, dyeing and medicine. In view of the importance of these facts and of the high price obtainable for the oil it was suggested that experiments should be conducted on a much larger scale.—J. Soc. Chem. Ind., 39 (1920), 111R.

Centaury.—*Adulteration of American.*—O. A. Farwell examined three bales of American centaury, weighing 472 pounds and found that it contained 113 pounds of drug true to name. The balance consisted of *Rhexia virginica* and *Stylosanthes biflora* which were not intermixed with the centaury occupying the outermost portion. In the case of the *Maidenhair Fern,* a layer of drug alternated with a shovelful of coarse gravel in regular succession. Five bags were examined, the total being increased 50 pounds by the gravel. In order to reduce the possibility of discovery to a minimum, each shovelful of gravel was deposited as nearly as possible in the middle of each layer of drug.—Bull. Pharm., 34 (1920), 238, through Bot. Abstracts. (H. W. Y.)

Chamomile.—*Swiss.*—Rolet gives a survey of the various species of chamomile, their properties and uses. He describes the cultivation of Roman chamomile.—Schweiz. Apoth. Ztg., 58 (1920), 373. (H. A. L.)

Chenopodium Ambrosioides and its Volatile Oil.—*A Study of.*—Elmer H. Wirth gives a detailed description of chenopodium describing fruit, pericarp, seed leaves and flower, together with numerous illustrations. Mr. Wirth's study was undertaken to determine the quality of oil obtained from plants grown in the middle west, the idea being prevalent that it was inferior to that from plants grown in Maryland. He reviews the literature, historical and theoretical, of the oil and gives details of the experimental work he did from which he found the composition of the two oils to be the same except in percentage of ascaridol of which the Maryland oil contains 60 to 80 per cent. while the western is only 42 to 45 per cent. A plan of fractionating to eliminate or reduce cymene seems to involve too much loss to be practicable commercially. Changes of climatic and soil conditions may prove the logical method of attacking the problem.—J. Am. Pharm. Assoc., 9 (1920), 127. (Z. M. C.)

Chenopodium.—*Cultivation and Uses.*—P. Van der Wielen discusses this drug from the standpoint of history, cultivation, constituents and its present-day use for hook-worm. He points out that up to 1912 the United States Pharmacopœia was the only one recognized the volatile oil.—Chem. & Drug., 93 (1920), 1334

Chrysanthemum.—X-rayser II discusses the Japanese chrysanthemum and then points out that a common English weed, the corn marigold, is *Chrysanthemum segetum.* The latter plant is further discussed by W. A. Munro and by T. W. Hazelby.—Chem. & Drug., 93 (1920), 1667 and 1715.

Cibucao Wood.—*Dye from.*—Cibucao wood from the Philippines contains a red coloring matter which is extracted and used variously by the Chinese as an ink, a stain, dye and paint color. The wood is boiled and the resulting solution by further boiling, concentrated to a syrupy consistence. Whiting is then mixed with it for most purposes, the resulting paste being the preparation used as an ink for the native "chops" or seals employed by them for affixing their signatures to written instruments. As a dye the stain is used for coloring cheap Chinese papers, notably the paper used in the manufacture of firecrack-

ers, ceremonial papers of various sorts, and for the very cheapest sort of Chinese stationary. The whiting concentrate is sometimes used as an adulterant for European red paints, while the color liquor is used at times for mixing with better quality of red dyes for coloring native cloths. The wood, called "soo mook" in Chinese, comes exclusively from Iloilo and vicinity in the Philippines.—Pharm. Era, 53 (1920), 140.

Cinchona.—*Alkaloidal Assay of.*—Curt Bamberger has examined the various methods recommended for estimating quinine in cinchona bark and on the strength of the results obtained he found that the process given in the Swiss Pharmacopœia is the most convenient. This is carried out by heating 2.5 grammes of the bark with 2 mils of hydrochloric acid and 20 mils of water for 10 minutes on a water bath. The mixture is then cooled, and 25 grammes of chloroform and 50 grammes of ether are added, followed by 5 grammes of caustic soda solution. The mixture is then shaken well, then sufficient plaster of Paris (40-50 grammes) is added to make the powder agglutinate and after clearing, the ether-chloroform solution is poured off and 60 grammes of the liquid (= 2 grammes of the bark) are shaken in a separator twice with 5 mils of N/10 hydrochloric acid and then twice with 10 mils of water. In the combined acid and wash water, the excess of acid is titrated back with N/10 caustic potash solution using methyl red as indicator. To the flask, which contains the plaster of Paris, water is added at once in order to prevent the calcium sulphate from becoming hard.—Pharm. Zentralhalle, through Pharm. Weekbl., 57 (1920), 1112. (H. E.)

According to Lehmann and Palm, it is impossible to extract all the alkaloids from cinchona bark with dilute hydrochloric acid. In order to obtain both the crystalline and amorphous alkaloid compounds from the bark it is necessary to use mixed solvents. The following process has been worked out by these authors: A 3 gramme sample of powdered cinchona bark is mixed with 60 grammes of 1 per cent. hydrochloric acid in a 100 mil flask and shaken thoroughly at intervals for 15 minutes. Filter off 50 mils of the liquid into a 200 mil flask; add 25

grammes of chloroform and 50 grammes of ether, shake, and render alkaline with 10 grammes of official (D. A. B.) sodium hydroxide solution. Shake vigorously for 2 minutes and occasionally for 10 minutes. Invert the flask and permit the aqueous liquid to run off until only 2 to 3 mils remains under the chloroform-ether layer. Now add ½ to 1 grammes of tragacanth and shake until solidified, pouring off 40 grammes of the ethereal liquid through a little cotton, into a weighing bottle. Distil off the solvent on a water bath, and dissolve the residue in 5 mils of alcohol and evaporate to dryness. Dry the residue for 10 to 15 minutes on a water bath, cool in a desiccator and weigh. The determination can also be made volumetrically by dissolving the residue in 10 mils of alcohol, warming slightly, adding 10 mils of N/10 hydrochloric acid, 50 mils of water and 3 drops of methyl red. The excess of acid is titrated with N/10 potassium hydroxide. One c. c. N/10 hydrochloric acid equals 0.0 309 grammes of alkaloid.—Arch. Pharm., through Pharm. Zent., 61 (1920), 81. (R. P. F.)

Cinchona.—*Bolivian.*—The headwater districts of the Beni affluents of the Amazon are the principal sources of the Bolivian supply of quinine. The product is placed on the market under different names, such as "cascarilla," "calisaya," "cinchona," and "quina." The bark which is stripped from the trunk of the tree is known as "quina tabla" and that which is stripped from the branches is called "quina canuto," or "quill." The bark is well dried and exported in bundles of about 50 pounds. Until the beginning of the present century this industry was very prosperous, the price of the bark reaching 204 bolivianos per quintal of about 101 pounds in 1878 in the Yungas of La Paz. With the development of the plantation product, however, the Bolivian bark found itself unable to hold its former place in the world market. During the last few years prices have again become more favorable, the industry has taken on new life in Bolivia. The Apolo, Mapiri, Challana, and Nor Yungas districts are the municipal producers, most of the exports passing through the west coast ports and Mollendo. According to Trade Commissioner W. J. Schurz, who writes from La Paz, exports of quinine bark during the period 1913-1918 were as follows:

1914, 45,633 kilos, valued at 26,538 bolivianos; 1915, 83,844 kilos, valued at 78,561 bolivianos; 1916, 168,670 kilos, valued at 158,488 bolivianos; 1917, 218,348 kilos, valued at 196,742 bolivianos; 1918, 190,528 kilos, valued at 168,919 bolivianos. Of the total production in 1918, the United States took 63.86 per cent.; Great Britain, 15.81 per cent.; and Spain, 9.48 per cent.—Pharm. Era, 53 (1920), 366.

Cinchona.—*"Grey."*—Howard and Chick state that grey cinchona bark from *Cinchona nitida* together with *C. Peruviana* and *C. micrantha* should yield about 0.45 per cent. quinine and 0.90 per cent. cinchonine. Two recent lots of South American grey bark yielded quinine 0.45 per cent., cinchonine 0.63 per cent. and quinine 0.33 per cent., cinchonine 0.58 per cent., respectively. However, a third lot from South America pronounced by E. M. Holmes as grey bark of Huanuco, yielded 0.027 per cent. quinine alkaloid and 5.490 per cent. cinchonine with 0.785 per cent. amorphous alkaloid. This sample consisted almost entirely of *C. nitida* bark with some *C. Peruviana* bark and a small amount of *C. officinalis* bark accidentally admixed. As *C. nitida* is very closely related to *C. Peruviana* and now not accepted as a separate species, this sample should be described as two or more forms of *C. Peruviana* bark. The very high percentage of cinchonine alkaloid is possibly due to growth at a low elevation in a hot, moist atmosphere. Here lies the possibility of developing a variety of bark very rich in cinchonine as the *Ledgeriana* variety of *C. Calisaya* has been developed very rich in quinine.—Pharm. J., 105 (1920), 79, through Bot. Abstracts. (E. N. G.)

Cinchona.—*Javanese.*—The greater part of the world's supply of this bark is from cultivated trees on the Java plantations. British India and Ceylon at one time produced large quantities but in the latter country, tea cultivation has supplanted cinchona. In describing this industry K. R. F. Blokzeyl states that the Java plantations were started about 1854 with seeds of the calisaya and succirubra varieties obtained in Bolivia. The introduction of *C. Ledgeriana* followed very shortly. Owing to hybridization botanical characters are uncertain but chemical

characters and especially the proportion of the different alkaloids is indicative of species. Barks for the manufacture of alkaloids are obtained from *C. calisaya, C. Ledgeriana* and a hybrid of the latter species with *C. succirubra*. Pharmaceutical barks are from *C. succirubra* and a hybrid of this species and *C. officinalis* termed *C. robusta*. An elevation of about 5,000 feet, a temperature around 17° and a rich loose textured soil is necessary to best growth. Plants are usually grown from seed, although grafting is sometimes preferable as a means of preserving desirable types. The bark is harvested from trees of about four years growth, the trees being cut down and the bark stripped. The bark is air dried and loses about 65 per cent. in weight during the process. Alkaloids are present in all parts of the plant but the greatest amounts occur in the parenchyma of the outer cortical layers of stem and root. Young trees give the largest yield of alkaloids and stem bark is richer than that of the root. Nearly all the bark is shipped to Amsterdam and prices are fixed by agreement between the growers and the buyers.—Pharm. Era, 53 (1920), 69. (C. W. B.)

According to H. L. H. Zakrzecki, Javanese growers are required to present to the Quinine Bureau their analysis of the sample of bark sent to the quinine manufacturer. If the manufacturer's analysis of the sample is higher than the planter's, the latter hears nothing of it, but if the manufacturer's analysis is lower by 0.15 per cent. or more of quinine sulphate, he has the right to reject the planter's analysis and demand a control analysis by analysts approved by the Quinine Bureau. As there are several methods of analysis for quinine content in vogue—the gravimetric, polarimetric, etc., which vary somewhat in results, the Quinine Bureau is to appoint a Commission to study these in order to establish a uniform method with the ultimate object of creating a single, central analytical laboratory.—Chem. & Drug., 92 (1920), 390, through Bot. Abstracts. (E. N. G.)

Cinchona Alkaloids.—*Decrease in Bark of Dead Trees.*—Although it has been generally assumed that the alkaloidal content of barks of cinchona trees decreases rapidly when the roots are diseased and the tree dies, analysis shows this to be untrue. A knife must be used to detach such barks, but samples showed

respectively 8.24, 7.19, 9.81, 11.06, 10.69 and 9.64 per cent. of alkaloid calculated as quinine sulphate.—Chem. & Drug., 92 (1920), 659. (K. S. B.)

Cinchona Preparations.—*The Influence of Hydrochloric Acid on.*—Wilbur L. Scoville reports the results of some experiments undertaken to determine the cause for the erratic results obtained with acidulated menstrua in extraction of cinchona. The U. S. P. method and various modifications were carried out with both yellow and red cinchona. Mr. Scoville gives details of procedure and submits some very conclusive figures. Hydrochloric acid facilitates the extraction of the alkaloids from both red and yellow cinchona and adds to the stability of their preparations because it reduces precipitation. The quantity should be sufficient to convert the alkaloids into normal hydrochlorides. In the assay of cinchona, preliminary treatment with hydrochloric acid yields a purer alkaloidal residue and so gives more accurate results. A 3 to 1 ether-chloroform mixture is better than the present 2 to 1 proportion.—J. Am. Pharm. Assoc., 9 (1920), 864. (Z. M. C.)

Citrus Fruits.—Roquetta outlines the history of the cultivation of the citrus fruits in the Mediterranean basin. The number of varieties of hesperidian fruits is considerable. Among the species whose rind is utilized for extracting the essences the following must be numbered: The lemon proper (*Citrus limonum*); the bergamot (*Citrus bergamia*); the cedrine (*Citrus medica*); the limette (*Citrus limetta*); the mandarin (*Citrus mandurensis*); the orange (*Citrus aurantium*); the bigarade (*Citrus bigaradia*). Literature is silent with regard to Citrus. The different names of these fruits have a Sanskrit origin. Both Greeks and Romans knew the lemon, but not the orange, the bergamot and the Spanish orange (limette). They designated the lemon under the names of *Malum Persicum*, *Malum Citratum*. The scent of the lemon was held to be fatal to certain parasitic insects.

From the eighth to the tenth centuries the Arabs propagated the bigarade and the lemon from the Gulf of Orman far into Syria and Arabia. Then from these centers the Crusades ex-

tended the cultivation to other lands. Since 1002 they have been cultivated in Calabria and also in Sicily.

The manuscripts of the twelfth and fourteenth centuries make frequent mention of the successive diffusion and fame of the hesperidian fruits. Edrisi, the Arabian geographer, recording his trips along the Mediterranean borders. describes the little lemons.

In the province of Reggio-Calabria and in Sicily the methods used for extraction of citrus oils are three, namely, sponging, skinning and machining. The sponging process consists in quartering the fruit, lifting the acid pulp and compressing the cortex against a sponge which is firmly held in the hand. The oily cells are opened and yield the liquid, which becomes absorbed by the sponge. The skinning process differs but little from the former, and consists in cutting the fruit in two parts (instead of four) taking out the pulp with a special spoon that has very keen edges similar to that of a razor. The machining process is carried on by means of an ingenious device invented by Auteri, of Reggio-Calabria, toward the eighteenth century, which compresses the fruit, causing it to pour out the essence, which goes then into a receptacle contained in the machine itself.—Am. Drug., 68 (Nov. 1920), 29.

Cocoa.—*The Mitscherlich Bodies of.*—J. Greger describes at length these formations in cocoa. He finds that they are one to several celled trichomes more or less broadened at the center. The single cells are frequently divided by walls; forking is seldom noted. The basal cells are mostly spread on the surface of the epidermal cells and when the bodies are forked, the basal cells are small.—Z. Oesterr. Apoth. Ver., through Pharm. Zent., 61 (1920), 47.

Coffee Bean.—*Toxicity of.*—Marsh and Clawson find that the seed of *Daubentonia longifolia* are very poisonous to sheep. The smallest dose of seed producing death was .11 pound per hundred weight of animal. The toxic principle is not named.—J. Agric. Research, 20 (1920), 507. (Bot. Abs.)

Cola Preparations.—*Assay of Caffeine in.*—G. Meillère treats the preparation (granulated salt or extract) with water and

any insoluble particles are then boiled with water. The mixed aqueous fluid is clarified by addition of solution of lead subacetate, an aliquot part of the filtrate is shaken out with several portions of chloroform, the chloroform is evaporated and the residual caffeine is then weighed.—J. pharm. chim., 22 (1920), 48.

Colchicum Seed.—*Alkaloids and Oil of.*—C. Grimme obtained by extraction of the seed with ether 17.6 per cent. of a light-brown odorless semi-drying oil which had a pungent taste. The following constants were found: Sp. gr., 0.9176, congealing point —9° refractive index 1.4642, acid number 20.3 (free oleic acid 10.2 per cent.), saponification number 184, iodine number 128.5 and unsaponifiable substance 0.71 per cent. The fatty acids obtained from the oil had a yellowish appearance, melted at 24°, congealed at 22.5° had a refractive index 1.4646, a saponification number 187.6, and iodine value 131 and an average molecular weight 300.3. It was also found that the percentage of colchicine in the seed is in inverse proportion to the weight of the seeds.—Pharm. Zent., 61 (1920), 521, through Bot. Abstracts. (H. E.)

Colutea Arborescens.—*Anatomy of.*—M. Fiala describes in detail the anatomy and other properties of this plant, which grows wild in Tyrol and which is cultivated in flower gardens elsewhere. The leaves are bitter and possess purgative action.—Pharm. Post., through Pharm. Zent., 61 (1920), 47.

Copal and Amber.—*Effect of Weather on.*—Copal and amber usually have a crust, the outer part of which, consisting mostly of mineral substances, may be removed mechanically, the inner layer being oxidized resin can be removed by washing with lye solution.

L. E. Andés put freshly broken pieces of Manila copal in pots, covered them with earth and exposed them to rain and sun. After 10 years exposure the pieces were taken out and washed carefully with water.

On examination a grayish white crust was found, small pieces of which showed numerous fissures under the microscope, a few drops of absolute alcohol rendered the pieces clear and trans-

parent, this transparency remained for several weeks, then the resin became cloudy and the fissures were again visible.—Pharm. Zent., 61 (1920), 382. (O. M.)

Cotton.—*Purity Standards for Absorbent.*—A. Wayne Clark, R. O. Smith and Leroy Forman discuss the work done on absorbent cotton, giving the methods used in the laboratory of Johnson and Johnson from 1912 up to the adoption of the U. S. P. IX in 1916. At the beginning of the World War both the U. S. Army and Navy adopted specifications and these are quoted. In the present paper the authors summarize the situation reporting upon the experimental work which they have done and the faults of present tests under the following heads: degree of absorbency, water extract, alcohol extract, ether extract and ash. Furthermore they suggest standards which should be required by the next Pharmacopœia.—J. Am. Pharm. Assoc., 9 (1920), 958. (Z. M. C.)

Cotton Root Bark.—*Pharmacology of.*—C. R. Eckler describes his study of this bark as to its activity and its value as compared to ergot. Thirteen different varieties of the cotton plant, collected at flowering, and a number of samples of commercial root bark, both green and dried, were tested for activity by methods commonly employed for the assay of ergot, namely, the cock's comb, blood pressure, and uterus methods. All these methods showed that the activity of cotton root bark was not in any way comparable to the activity possessed by ergot.—Am. J. Pharm., 92 (1920), 285. (J. K. T.)

Cupressus Sempervirens.—*Use in Hemorrhoids.*—H. Leclère finds the vaso-constrictive properties of cypress buds equal to those of hamamelis. In hemorrhoids, he uses the fluidextract internally and suppositories containing the extract directly to the hemorrhoids.—J. pharm. chim., 22 (1920), 364.

Datura Stramonium.—*Volatile Oil of.*—A. Sivolsbof has distilled stems of *Datura stramonium* cut level with the roots. He observed first of all the liberation of carbonic acid and a gas with a narcotic odor. This gas, unabsorbed by potash, produces toxic effects. Distillation was carried on for a long time,

so that the water passing over at the end should have no odor. After repeated distillations, the author obtained a mixture distilling between 60° and 81° C. This mixture, which has a strong odor of datura, consists of compounds of the fatty series. The alcohols are principally methyl and ethyl alcohol. The aldehydes are acetic aldehyde and probably formic, propionic and isobutyl aldehydes, as well as another one of higher boiling point. The presence of acetone, another undetermined ketone, and formic and acetic esters were also detected.—J. Soc. phys.-chem. Russe, through Pharm. Era, 53 (1920), 273.

Digitalis.—*Activity of Aqueous Extracts of.*—Roessler examined the following aqueous extracts of digitalis as to their physiologic activity: (1) An infusion, (2) a regular maceration, and (3) a maceration-infusion which was obtained by first making a maceration of the leaves, then an infusion of the macerated leaves and mixing the two liquids. The experiments showed that the maceration acts much more promptly than the infusion and that its action is more intense and lasting than that of the maceration infusion. That some patients do not tolerate the maceration as well as they do the infusion seems to be due to the fact that the former contains a larger amount of saponins than the latter. By emulsifying the maceration with olive oil, however, these untoward effects could be eliminated. The author further found that infusions of digitalis do not deteriorate as rapidly as is generally accepted. An infusion, seven days old, had practically the same therapeutic effects as a freshly prepared infusion. The action of aqueous preparations of digitalis seems to be due to a combined effect of gitalin and digitalein. —Therap. Gegenw., through Drug. Circ., 64 (1920), 218.

Digitalis.—*Administration of.*—Pardee points out that the variable susceptibility of different patients is an important thing to recognize in the administration of digitalis. The patient to get satisfactory results should be highly saturated with the drug; to obtain this condition, the usual dose will have to be greatly increased. The average total dose of two minims of the tincture to each pound of body weight will produce early toxic signs. Pardee found that the average rate of disposal of the drug by the body was twenty-two minims of the tincture a

day, although this amount varied in different patients from ten minims to forty minims a day. Ten minims, twice a day, three or four days after the initial dose however, cause no toxic reaction, although the drug is passed off at a much slower rate than the average rate of disposal.—J. Am. Pharm. Assoc., 9 (1920), 542. (M. O'C. D.)

Digitalis.—*Chemistry of.*—At the Chicago meeting of the American Chemical Society, H. C. Hamilton discussed in a general way the difficult problem of digitalis. He has but little hope that the chloroform-soluble constituents will be found of greater therapeutic value than those insoluble in chloroform.—J. Ind. Eng. Chem., 12 (1920), 1180.

Digitalis.—*Some of the Important Constituents of.*—William J. M. McGill summarizes the results of his work in the following conclusions:

1. It is possible with careful manipulation and uniform methods of procedure to obtain crude fractions from the drug by means of various solvents which will have a reasonably constant chemical composition. In view of the difficulty of separating individual glucosides in a chemically pure state from the crude fractions such an undertaking at present seems to have no commercial value.

2. The cold-water extract of the leaves contains either none or a very minute amount quantity of digitoxin, its activity being due entirely to a chloroform-soluble and to a chloroform-insoluble fraction. In view of the fact that Kiliani reports that "Gitalin" made according to Kraft's process, is a mixture containing some digitoxin, this cold-water extract requires further investigation, especially as very little is known of the chloroform-insoluble portion.

3. The saponin substance of digitalis leaves, *digitisaponin*, is a totally inactive and non-hemolytic subtance when purified. This disposes of one possible source of error in pharmacological tests on the leaf.

4. Hatcher's chloroform-soluble fraction of the infusion is a mixture of "Gitalin" and digitoxin. If the accepted theory that the cause of the deterioration of digitalis preparations is the

water-soluble chloroform-soluble substance or substances which we have designated as "Gitalin" is true, then such a fraction should also be unstable. Work is being continued on this point. —J. Am. Chem. Soc., 42 (1920), 1893. (J. L. M.)

Digitalis.—*Interesting Features of.*—In this contribution, H. C. Hamilton discusses many points of interest to the physician, pharmacologist and pharmacist. Originally both leaf and root were employed in medicine but, owing to the variability of the latter its use was discontinued. *Digitalis purpurea* was probably selected as the official species because of its wide distribution and size. The writer states that leaves of the first year's growth are equal in therapeutic activity with those of the second year. The greater part of the article deals with the various methods for the biological standardization of digitalis and its preparations and many valuable criticisms are stated. The question of the influence of different menstrua upon the constituents of digitalis and incidentally upon the activity and stability of pharmaceutical preparations is briefly discussed.—Pharm. Era, 53 (1920), 103 and 134. (C. W. B.)

Digitalis.—*Manganese in.*—Some years ago Burman claimed that only *Digitalis purpurea* contains manganese, that it was not present in other species of digitalis such as *D. ambigua, D. lutea,* etc., and that the presence of manganese in the ash of digitalis could serve for distinguishing the official drug from other species of digitalis. D. H. Wester, however, found that all plants of the foxglove family contain manganese. The ash of the flowering tops of D. purpurea in the green state contain from 0.7 to 0.85 per cent., of the seeds from 3.2 to 3.7 per cent. and the leaves from 1.3 to 3.2 per cent. The percentage of manganese in the ash of the three different parts of the dry plant are 5.8 to 9.7 per cent., 3.5 to 4.1 per cent. and 6 to 13 per cent., respectively. In general the percentage of manganese in digitalis is to be considered as low, considering that in other plants. Furthermore the percentage of manganese varies considerably with the soil in which the plant grows.—Pharm. Weekbl., 57 (1920), 660. (H. E.)

Digitalis.—*New Body from.*—R. A. Hatcher reports some observations on the pharmacology of a digitalis body which he prepared in an attempt to obtain a digitalis preparation which is absorbed from the gastro-intestinal tract with greater uniformity than are the tinctures or other preparations of digitalis. From his investigation Hatcher concludes that, water exhausts ground digitalis leaf and from the infusion thus prepared, chloroform removes a principle which resembles digitoxin somewhat, both chemically and pharmacologically, and which is more readily absorbable from the gastro-intestinal tract of the cat than is its residue remaining in the infusion. The chloroform-soluble substance is soluble in alcohol and the alcoholic solution is miscible with water without precipitation. He believes that this digitalis body is suitable for intravenous and probably for intramuscular injection in the relatively few cases in which such methods of administration may be necessary.—J. Am. Med. Assoc., 95 (1920), 460. (W. A. P.)

Digitalis.—*Pharmacological Evaluation of.*—Augustin in a series of tabulations gives the result of the examination of different batches of digitalis leaves which had been collected in the years 1913, 1914, 1915, 1916, 1917, 1918, 1919, respectively. A modified "frog method" was employed. The results show that carefully dried digitalis leaves will not lose their activity even after several years.—Ber. dtsch. Pharm. Ges., 30 (1920), 278. (H. H. S.)

Digitalis.—*Practical Considerations Concerning.*—R. Wasicky discussed the practical side of digitalis at the 1920 meeting of the German Naturalist and Physicians. He reported that digitalis leaves grown in the dark had only one-half the toxicity (frog method) of those grown in sun-light; that microscopic study showed that the glucosides developed in the fluid of the mesophyll cells; that it was advantageous to gather digitalis leaves in the afternoon; that the drug was of better quality, when the fresh leaves were dried artificially at 60°; and that 25 per cent. alcohol was the best extraction solvent. Wasicky points out that one German drug firm is furnishing a "normal drug" of carefully standardized quality.—Pharm. Ztg., 65 (1920), 765.

Digitalis.—*Storing of.*—Jermstad reports on Grönberg's work on the storing of digitalis leaves. Grönberg's conclusions are that digitalis leaves retain their activity to a greater degree if kept under the following conditions: Dry immediately after collection, limiting the moisture content to a maximum of 1.5 per cent. Reduce to a coarse powder, enclose in small containers (for drugstore use 100 grammes each) preferably glass stoppered and protected from light.—Fenska Apoth. Tid., through Schweiz. Apoth. Zt., 58 (1920), 261.

Digitalis.—*Therapeutics of.*—Thanks to the development of appropriate methods of physiologic assay, digitalis preparations can now be evaluated in terms of their real potency, and products can be prepared which are stable and constant as the pharmacopœial standards demand. Physicians have learned, largely through the leadership of Cary Eggleston, how to estimate digitalis dosage on the basis of body weight. As the possibility of overdosage can be recognized by the occurrence of symptoms such as nausea, or by the electro-cardiograph, it becomes possible to push the dosage speedily to the limit of tolerance, with corresponding therapeutic advantage. There remains, however, the important need of differentiating more clearly the patients for whom digitalis is actually indicated.—J. Am. Med. Assoc., 75 (1920), 417.

Digitalis.—*Value of Second-Year Leaves.*—G. Joachimoglu found that digitalis leaves of plants grown from the same kind of seeds on different soils varied in toxicity from 66 to 100 per cent. when assayed by the frog method. The requirements of the German pharmacopœia that only two year old plants should be used is not justified because the leaves of one year old plants are more active. Digitalis leaves when dried at 60° did not lose any of their activity within one year and the loss in leaves dried in the ordinary way was only very slight during the same period.—Arch. Pharm., through Pharm. Weekbl., 57 (1920), 799. (H. E.)

Digitalis Flowers.—Dr. Paul Nother describes how he collected digitalis flowers, dried them, and made cold aqueous extracts,

alcohol extracts and infusions thereupon. The various preparations were standardized by the frog method. His conclusions are that the flowers contain about 0.7 per cent. of active glucoside which is readily extracted with water, is stable, heat resistent and permanent.—Ber. dtsch. Pharm. Ges., 30 (1920), 402. (H. H. S.)

Dragon's Blood.—*A Sketch of the Medical History of.*—Torald Sollmann reviews briefly the literature of *Resina Draconis.* He gives botanical name and source of different varieties of the drug known as dragon's blood. He quotes some interesting statements made by Rhaenodaeus in the seventeenth century and relates something of the action and uses claimed for it in those earlier days.—J. Am. Pharm. Assoc., 9 (1920), 141. (Z. M. C.)

Ergot.—*Constants for Its Oil.*—From Russian ergot, J. Zellner obtained 30 to 35 per cent. of an oil having the density, 0.9258; solidifying point, —15°; refractive index, 1.4688; acid number, 11.4; saponification number, 180.5; iodine number, 68.6; acetyl number, 73.6; insaponifiable material, 0.5 per cent. While fresh ergot contains 30 per cent. of oil or over, samples that are ten years old contain only 7 to 10 per cent. This latter oil is yellow brown with greenish fluorescence and is fairly stable. The oil from fresh ergot consists of the glycerides of palmitic and oleic acids.—Chem. Umschau, through Pharm. Zent., 61 (1920), 745.

Ergot.—*History and Chemistry of.*—Prof. George Barger's comprehensive paper includes a history of the ancient and medieval epidemics, the autiology; toxicological and medicinal properties; the botanical history and chemistry of ergot.—Pharm. J., 105 (1920), 470. (F. H.)

Eucalyptus.—*Production in Victoria.*—During 1917-1918, the eucalyptus oil distilled from forest areas amounted to 806,977 lbs., an increase of 161 tons on the previous year. The areas in the northwest chiefly bear trees of the blue mallee species, and are now regularly cultivated under a coppice system. They are not classed as forest reserves, but arrangements have been made

with the Lands Department for the issue to eucalyptus distillers of annual licenses. In the Wombat forest, Central District, where many small stills are in operation, the peppermint tree only is used; most of the plants are crude and are not properly equipped. At Bendigo, where the foliage of the red and white ironbark is used, there are several good mills, and the industry is useful in disposing of large quantities of surplus coppice growth, which has to be removed in the treatment of the young forests.—Chem. & Drug., Australia, through J. Soc. Chem. Ind., 39 (1920), 167R.

Eucalyptus.—*Use in Diabetes.*—As the result of a paper published in the *Revue horticole d'Alger,* the treatment of diabetes by infusion of eucalyptus leaves has been frequently tried. Dr. Perez, in a communication to Dr. Trabut says that after reading of the good effect produced by the drug many experiments had been made, and complete success attained; he did not think there were any more cases of diabetes in the island (Teneriffe). A very marked aphrodisiac action was also observed. Dr. Trabut has himself frequently prescribed it with very favorable results. A decoction of 10 to 15 grammes of leaves in 500 mils of water is employed, but a fluidextract would probably be a more convenient preparation.—Bull. Gen. Therap., through Pharm. J., 105 (1920), 287.

Figs.—*Cultivation in America.*—Smyrna fig culture in the Southwest has made rapid progress since the Bureau of Plant Industry leased an orchard at Loomis, Cal., for the purpose of supplying growers with caprifigs. The Smyrna fig is fertilized by an insect living upon the caprifig and the grower usually plants female and male (caprifig) trees together. As the male trees develop slowly he is dependent for a time upon outside sources for caprifigs to properly pollinate the female or fruit bearing trees.—Pharm. Era, 53 (1920), 38. (C. W. B.)

Flour.—*Detection of Rhinanthin in.*—A. Nestler states that rhinanthin is a glucoside from seeds of *Alectorolophus hirsutus* and *Melampyrum arvense* with which meal may be adulterated, producing a blue-green color in the presence of acid. The result

is known as "blue bread." Five to ten per cent. hydrochloric acid is used in the identification test described.—Z. Untersuch. Nahr. Germssm., 39 (1920), 41. (Bot. Abs.)

Gentian.—*Comparative Study of Various Sorts.*—R. Osterwalder studied commercial types of *Gentiana lutea, G. purpurea, G. punctata, G. Pannonica* and *G. asclepiadea.* He discusses the destruction of *Gentiana lutea* plants by the worm, *Botrytis cinerea;* he deprecates the commercial demand for fermented gentian root, since it is inferior medicinally to the unfermented drug; and he then describes the structure differences between the various species, pointing out that the roots of *G. asclepiadea* has many points of difference from that of *G. lutea.* The article closes with what he considers should be the wording of the official monograph.—Schweiz. Apoth. Ztg., 58 (1920), 201.

Gentian.—*Keeping Quality of Certain Preparations.*—In 1911, in the course of an investigation, M. Bridel dried gentian root in the air, without fermentation, and prepared from it a powder, a percolated extract with 60 per cent. alcohol, a percolated tincture with 60 per cent. alcohol, a macerated tincture with 60 per cent. alcohol, a tincture made with boiling 60 per cent. alcohol and a macerated tincture made with 95 per cent. alcohol. These preparations when first made were assayed by the biological method of Bourquelot. Nine years later all were biologically assayed again with the following results:

1. The carbohydrate content of the powder and the extract were unchanged, but the content of all of the tinctures had diminished. From the tincture made from 95 per cent. alcohol, saccharose had crystallized out.

2. The gentiopicrin content of the tincture made from 95 per cent. alcohol decreased 5.38 per cent.; of the percolated alcoholic (60 per cent.) tincture, 10.96 per cent.; of the tincture made with boiling 60 per cent. alcohol, 15.31 per cent.; of the extract 24.73 per cent. All of the gentiopicrin had disappeared from the powder and in its place was found a glucoside that was hydrolyzable with emulsin. Likewise, the gentiopicrin in the macerated tincture was missing and in its place was found what was apparently beta-ethylglucoside.—J. pharm. chim., 22 (1920), 411.

Gentian.—*Propagation of.*—The collectors of gentian root maintain that pieces of root left in the ground develop stems and new plants. Experiments made by E. Fischer in the Botanical Gardens at Bern have not confirmed this. Only in one instance in which portions of the rhizome were left did any development of stem take place.—Schweiz. Apoth. Ztg., through Pharm. J., 104 (1920), 72.

Geranium Maculatum.—*A French Test and Analysis.*—A test of this plant made by E. Cabannes shows that the rhizome contains about 27 per cent. of tannin. Obstinate diarrhea may be treated with from 2 to 4 grammes given as a powder in cachets or in the form of a decoction. The tincture or syrup made from the fluidextract are unsuitable preparations. A soft, hydro-alcoholic extract mixed with a suitable vehicle gave good results in hemorrhoids.—Bull. Sci. Pharm., through Nat. Drug., 50 (1920), 193. (C. M. S.)

Gilletiella Congolana.—*A New Oil Seed.*—The seeds of *Gilletiella congolana*, a large climbing plant, with an enormous root weighing from 10 to 40 kilogrammes, have been examined by J. Pieraerts. They vary from 36 to 50 Mm. in length and the same in width and weigh from about 14 to 30 grammes. They yielded 47.62 per cent. of crude fixed oil, extracted by ether. The residue after extraction gave 4.34 per cent. of ash, 19.25 per cent. of proteids, together with sugar, pentosanes, and cellulose, but no starch. The oil is of a pale golden yellow color, clear when first prepared, but forming in the course of a week an abundant crystalline deposit. The principal constants of the oil are as follows: Refractive index at 22°, 1.4664; acid value, 2.2; saponification value, 200.9; iodine value, 78.9. The liquid oil, separated from the crystalline deposit, resembles olive oil, but it is not at present quite certain that it is edible.—Bull. Sci. Pharm., through Pharm. J., 105 (1920), 510.

Ginger.—*Growing Wild in South America.*—It has been assumed that the true ginger plant (*Zingiber officinale*) is not known in the wild state, though it doubtless is a native of tropical Asia, but extensive areas of wild true ginger plant were recently found

in the Republic of Colombia along the Magdalena river in Goajira peninsula. These probably escaped from cultivation in Brazil when the Portuguese introduced ginger in the sixteenth century. Commercially, this wild ginger may prove a valuable source of the drug, though the rhizomes are small; also this region may prove desirable for the cultivation of ginger.—Chem. & Drug., 92 (1920), 177, through Bot. Abstracts. (E. N. G.)

Ginger-Beer Plant.—*Note on.*—In a summary on the life history of the ginger-beer plant, E. M. Holmes compares it in appearance to pearl barley that has been boiled.

This symbiotic ferment is composed of a yeast and a bacterium. Its similarity and differences to kephir and koumiss are carefully noted. A minute description of both organisms and a recipe or a wine prepared from the ginger-beer plant concludes the article.—Pharm. J., 104 (1920), 4. (F. H.)

Grasses.—*A New Genus of.*—An interesting instance of the discovery of a grass not only new to science, but found by Dr. O. Stapf, of Kew, to have such characters as to necessitate its classification in a new genus, has recently occurred. This new plant, *Thellungia advena*, was found first about 1907 by Dr. Tellung, of Zurich, growing among the refuse of a worsted mill at Derendingen, near Solothurn, Switzerland. The rich alien flora around this mill includes numerous grasses of Australian origin, and at first it was doubtfully classed as a species of *Ectrosia*. Pot culture of the plant failed; but in the hot weather prevailing in 1916 the wild specimens flowered sufficiently well to enable a systematic examination to be made at Kew, with the results stated above. A full technical description of the new genus, and of its only representative known at present is given, with a drawing of the plant in *Kew Bulletin*, 1920 [3] 96. That alien plants are introduced in this manner round industrial works is of frequent occurrence; instances of their maintaining their footing, and spreading sometimes to an undesirable extent, are also not unfrequent. It is not often, however, that such introductions prove to be of unknown genus and species.—Pharm. J., 105 (1920), 178.

Gums.—*Identification by the Phenylhydrazine Reaction.*—Experimental data indicate that this test might be valuable in the differentiation of gums. C. W. Ballard limits his paper to a consideration of the osazones obtainable from a few gums and gum-containing drugs. A solution is prepared and inversion of the soluble carbohydrate is brought about by addition of hydrochloric acid and boiling. The reagent must be a freshly prepared solution of phenylhydrazine hydrochloride, 1 gramme, and sodium acetate, 3 grammes in 25 mils of water. Equal quantities of the filtered liquid containing the inverted carbohydrate and the reagent are placed in tubes in a beaker of boiling water and kept at that point for an hour and then slowly cooled. Sometimes recrystallization is necessary and even then some gums yield no crystals.

Mr. Ballard gives characteristics of the crystalline precipitates obtained from acacia, althæa, cetraria, elm bark, linseed, Indian gum, brown and yellow mustard, peach, apricot and bitter almond kernels, quince seed, sassafras pith and tragacanth, and illustrations are shown also. He believes the test is certain enough to be used as an identity test.—J. Am. Pharm. Assoc., 9 (1920), 31. (Z. M. C.)

Henna.—*Notes on.*—B. W. Hofstein describes this substance pointing out that the word means "to become queen." It is known by different names in different localities. In Persia as henna, in Egypt it is called khenna, in Arabia it is known as alkenna, in India as mendeed and in the West Indies where it has become naturalized, as Jamaica mignonette.

Originally it was used as a prophylactic against certain skin diseases. It is claimed that it reduces the activities of the sweat glands when an infusion of the leaves is applied and gives a sensation of coolness and comfort. The root has been upheld as a specific for leprosy, the flowers yield a perfume having an odor resembling lilac, while the fruit is claimed to be an emmenagogue.

The most common use of the drug among the ancients was as a dye; it being deemed indecent by both men and women among the Mohammedans not to do so. In China the infusion is used to produce a red line underneath the eyebrows. In most Mo-

hammedan countries it was also used to dye either the hair, soles of the feet, palms of the hands and finger nails as well as to color the manes and tails of horses.

While the infusion of the leaves dyes objects an orange color, darker shades were obtained by addition of infusions of catechu or alfalfa leaves, while vinegar and alum were both employed for the same purpose as well as acting as mordants. Its use extended to the staining of woods and soft leathers, the color or shade depending chiefly upon the mordants employed.

The writer concludes his paper with the results of the investigation of a number of proprietary preparations which pretend to depend upon henna for their tinctorial power.—Proc. Pa. Pharm. Assoc., 45 (1920), 241. (L. S.)

Hops.—*Bitter Acids of.*—Luers and Baumann find that humulone (a hop bitter acid) exists in aqueous solution and in wort in the form of hydrosol, with a negative charge. It is strongly absorbed by charcoal from aqueous solution, and its power of producing a stable foam is in keeping with its power of reducing the surface tension and its adsorption.—Koll. Zsch., through J. Soc. Chem. Ind., 39 (1920), 498A.

Hop Vines.—*Use as Surgical Dressing.*—A novel application of the silica therapy now so popular in Germany is the suggestion of A. Krüche that the dried stems of the hop vine be employed as a surgical dressing.—Pharm. Zent., 61 (1920), 409.

Hemlock Bark.—*Use in Pharmacy.*—Garr and Ewe present evidence to show the superiority of the rossed bark over the whole bark for pharmaceutical purposes. By separating and weighing the two portions, it was noted that the outer bark constituted 55.34 per cent. while the inner bark was 44.66 per cent. In the percentage of extractive matter, using 32 per cent. alcohol and hot water respectively, it was noted in general that there is no preference, quantitatively between the two barks, but qualitative preference is on the side of the extractive matter from the inner bark, since it is higher in tannin, oleoresin and volatile oil content and lower in the non-essential coloring and extractive matters. Tannin content is about 50 per cent. greater

in the inner bark. The outer bark contains, on the average, twice as much hot water water-soluble coloring matter as the inner bark and 3½ times as much coloring matter soluble in 32 per cent. alcohol. Microscopic examination showed a tremendously greater content of volatile oil and oleoresin content in the inner bark. Therefore the inner bark is to be preferred for pharmaceutical purposes. The microscopic structure and pharmaceutical uses are then discussed.—J. Am. Pharm. Assoc., 9 (1920), 567.

Horse Chestnuts.—*Extraction of Starch from.*—Wischo shells horse chestnuts, splits them down the center to remove the embryo and then grinds the starchy residue in a mill, mixes it with water to a paste, runs the paste through a sieve and then macerates the strained material with successive portions of water until all of the saponin is removed. The starch thus treated precipitates to the bottom of the tank and is drained, dried and powdered.—Z. œsters. Apoth. Ver., through Pharm. Zent., 61 (1920), 395.

Hydrastis.—*Assay of.*—The determination of hydrastine in *Hydrastis canadensis* and its galenical preparations is said to be more accurate if the silicotungstic acid method is used. Wattiez has investigated the method and concludes that the views of Bertrand are correct; the precipitate has the general formula $12\ WO_3SiO_2 2H_2O + 4$ mols. hydrastine $+ nH_2O$, and after ignition $12\ WO_3SiO_2$, which corresponds to four molecules of the alkaloid, making the factor 0.342.

The technique of the determination as applied to *Hydrastis canadensis* is as follows: 7.4 grammes of the powder of the rhizomes, previously dried at 50° C., are placed in a 250 ml round bottomed flask provided with a reflux condenser and containing 150 grammes of alcohol at 70°. This is placed on a boiling water bath for three hours. The original weight is maintained by the addition of alcohol. The mixture is allowed to cool, filtered, and 120 grammes of the tincture, corresponding to 6 grammes of the powder, are evaporated to a syrupy consistence. The residue is taken up by sufficient 25 per cent. sulphuric acid to make a total weight of 15 grammes. After

standing an hour the berberine sulphate is precipitated and after the addition of one gramme of talc the solution is filtered off into a tared Erlenmeyer flask until 10 grammes have been collected. This is made alkaline with ammonia, allowed to cool and 40 grammes of ether added and the whole shaken vigorously for half an hour. After standing, 35 grammes of the ethereal solution, representing 3½ grammes of the powder, are decanted off, washed with distilled water and then extracted with a one per cent. solution of hydrochloric acid, until it no longer gives the Mayer reaction. The aqueous acid solutions are united, filtered and warmed to drive off the ether. After cooling, the hydrastine is precipitated with 15 mils of 5 per cent. silicotungstic acid, then heated to a boil. After standing twenty-four hours it is filtered, washed and calcined to constant weight. The result obtained, multiplied by 28.57, gives the weight of silicotungstic acid corresponding to 100 grammes of the original powder. The same procedure has been successfully applied to testing both the fluidextract and the tincture of hydrastine, and the results have in all cases agreed very closely.—J. Pharm. Belg., through Pharm. Era, 53 (1920), 366.

Hydrastis.—*Cultivation in Russia.*—Professor Wallner of the University of Dorpat finds that hydrastis can be satisfactorily cultivated in Esthonia; the rhizomes produced under his cure yielding 2.9 per cent. of hydrastine in May and 3.32 per cent. in August, which he finds is the proper time for collection.—Bull. Sci. Pharmacol., through Schweiz. Apoth. Ztg., 53 (1920), 587.

Hydrastis.—*Quality of Commercial.*—A. Viehoever reports the results of an examination of domestic hydrastis collected in 1917 and 1918. Samples were examined for alkaloidal content, amount of moisture, total ash and acid-insoluble ash. Samples of known origin carefully collected and carefully washed were tested also, in order to determine the amount of ash which is reasonable. Rhizomes and roots were tested separately and all of the findings are carefully tabulated. The alkaloidal content of the rhizomes was found to be higher than that of the roots. The requirement might well be raised to 2.75 per cent. if the drug were properly cleaned. The yield of ash, both total and

acid—insoluble of the roots was greater than that from the rhizomes. A maximum limit of 8 per cent. acid-insoluble is suggested.—J. Am. Pharm. Assoc., 9 (1920), 779. (Z. M. C.)

Hyenanche Globosa.—*Constituents of.*—At a meeting of the Chemical Society, T. H. Henry discussed this plant, which belongs to the natural order Euphorbiaceæ, and occurs in South Africa, where it is used for poisoning wild animals, especially hyenas, a use reflected in the generic name Hyenanche and also in the common name of the plant, hyena-poison. It was examined in 1858 by Henkel, and in 1892 by Engelhardt, and shown to contain a toxic substance, which the latter author isolated in crystalline form and called hyenanchin. It is now shown that the crude crystalline material isolated from the plant consists of two isomeric crystalline substances of the formula $C_{15}H_{18}O_7$; one of these is toxic, and for this the name hyenanchin is retained, whilst the other, which is physiologically inactive, it is proposed to call *iso*hyenanchin. Pharmacological investigation of these two substances is still in progress by Dr. J. Trevan, of the Wellcome Physiological Research Laboratories, but sufficient has been done to show that hyenanchin has an action weaker than, but identical in kind with, that of picrotoxinin, and so belongs to the group of non-nitrogenous, convulsant poisons. It is interesting in this connection to note that just as hyenanchin occurs along with the non-toxic isomeride, picrotoxinin is associated in *cocculus indicus* with the inactive substance picrotin. All four substances are dilactones, and whilst picrotoxinin and its associate yield acetone on distillation with alkalies, hyenanchin and its isomeride yield hydroxyacetone. The subsidiary components of Hyenanche include a new wax alcohol $C_{42}H_{40}OH$, a new phytosterol $C_{28}H_{46}O$, and a new yellow coloring matter $C_{15}H_{12}O_6$, belonging to the flavone series, and showing some characteristics in common with morin. —Pharm. J., 105 (1920), 506.

Hypericum and Digitalis.—*Noxious Weeds in Australasia.*—Considerable consternation has arisen in the neighborhood of Wagga, N. S. W., by the discovery that the St. John's wort, *Hypericum perforatum,* has taken firm hold of certain parts of

the district, and threatens to render valueless a considerable tract of country, if its spreading cannot be prevented. There are several parts of the Commonwealth in which this pest has taken such hold that cultivation of crops has become difficult, and native herbage has been destroyed by the invader. The foxglove, *Digitalis purpurea*, has become a noxious weed in New Zealand. These and many other instances emphasize the danger of indiscriminate introduction of freely seeding foreign plants into the Antipodes. It is not surprising to learn that the suggested distribution of seeds of wild plants from the Somme valley battlefields has met with a strong protest in the N. S. W. Press. The danger of the spread by this means of such weeds as the red poppy is considered to be too serious to warrant the risk being incurred for purely sentimental reasons.—Austral. J. Pharm., through Pharm. J., 104 (1920), 522.

Ilex Paraguayensis.—*Popularity in South America.*—Inquiries in the trade and frequent references in scientific literature indicate an increasing interest in yerba mate, or Paraguayan tea, a caffein containing plant indigenous to Paraguay and used by the natives long before the Spanish conquistadores reached South America. H. Herzfeld gives an account of its natural history, preparation, chemical composition, and physiological effects. Mate is used as a beverage almost entirely in South America, although there is a small demand for it in certain European countries, especially Italy. According to reports of consular officers to the U. S. Department of Commerce, the best grades of yerba mate are said to grow in Paraguay, but the amounts grown in Argentina and Brazil are much larger, the total estimated production per year being given as about 6,000,000 kilos. The bulk of this production is exported to Argentina, where the tea is mixed with the Argentinian production for local consumption or for export under the name of "Paraguayan yerba mate." In Argentina, it is said, the demand for the tea is so great that exporters have little interest in trying to find other markets.—Pharm. Era, 53 (1920), 353.

Ilex Paraguayensis.—*Properties of.*—C. R. Henings describes the physical appearance and gives results of comparative

analyses of Paraguay, Indian and Chinese teas. The methods employed in these analyses are described. Variations with the results of Dr. C. Peckolt are explained by the fact that the latter used different methods and that teas themselves vary considerably with the season. Tabulations of such variations in teas collected in May and November are provided. Likewise results of examinations are noted. Finally the production of this tea and its cost is discussed.—Ber. dtsch. Pharm. Ges., 30 (1920), 22. (H. H. S.)

Ipecac and Its Preparations.—*Ipecacuanhic Acid Assay of.*—R. Huerre believes that emetine is not the sole important constituent of ipecac, but that the tannin like body, ipecacuanhic acid, also plays a rôle in ipecac therapy. He describes this acid which he extracts from the drug by treating it with boiling water and then precipitating the acid from the concentrated infusion by addition of an excess of a saturated solution of ammonium sulphate; the crude acid being freed from the ammonium sulphate by repeated solution in 90 per cent. alcohol.

This acid appears to be glucosidal, since careful experiments show that it reduces Fehling's solution both before and after hydrolysis with diluted sulphuric acid. Its solubility properties show that it is not quercitannic acid nor filicitannic acid, while its property of forming precipitates with a large number of saturated solutions of alkaline salts is more or less distinctive.

Huerre has devised an assay of the acid based upon the determination of the sulphate in the ammonium sulphate precipitate by the usual barium sulphate gravimetric assay applied directly to a diluted aqueous solution of the ipecacuanhic acid ammonium sulphate mixture. By this method he found the ipecacuanhic acid content of ipecac and its preparations; root, 3 to 4 per cent.; alcoholic extract, 26 to 31 per cent.; tincture 0.34 to 0.38 per cent.; syrup, 0.26 to 0.3 per cent.—J. pharm. chim., 21 (1920), 425.

Iris Pseudacorus.—*Constituents of Seed of.*—It is pointed out that the seed of this plant contains 14.04 per cent. of fat, 4.63 per cent. of water, 9.74 per cent. of protein, 26.33 per cent. of nitrogen free extractive, 43.22 per cent. of fiber and 2.04 per cent.

of mineral salts. In war times, it might be serviceable as a cattle food.—Chem. Ind., through Pharm. Zent., 61 (1920), 107.

Jalap.—*Production in Mexico.*—The greater portion of commercial jalap is produced in a small district in the State of Vera Cruz and the drug is but one of a long list of products native to Mexico. The plant is a perennial, twining climber and flourishes best in the higher parts of the country where rain is abundant. The jalap tubers are developed from buds in the leaf-axils on the runners. Because of the native method of drying over fires, the product is apt to possess a smoky odor and taste. Insect-infected tubers are stronger in purgative action and should only be used in the manufacture of the resin. Jalap is cultivated in India and is an article of commerce in that country. The root of *Piptostegia* furnishes the "Brazilian jalap" which is high in resin.—Pharm. Era, 53 (1920), 75. (C. W. B.)

Jerusalem Artichoke.—*History of.*—C. C. Lacaita, in an interesting review of the published history of this now familiar vegetable asserts positively (1) that it was not originally distributed from the Farnese gardens; (2) that it was not called *Girasole Articicocco* in those gardens (artiocco is an obvious misprint); (3) that it has never been known by that name in Italy. As far as can be traced, the Jerusalem artichoke was first noticed by Europeans during Champlain's second voyage to North America in 1604-1607. They were introduced into France, either by some members of these expeditions, or possibly by the apothecary Herbert, who accompanied Lescarbot on a similar voyage. The latter explorer describes the plant as being cultivated by the Canadian natives. Lescarbot states that "Nous avons apporté quelques-unes de ces racines en France, lesquelles ont tellement multiplié, que tous les jardins en sont maintenant garnis." They were sold in the Paris streets in 1617 under the name of "*Topinambaux*" (topinambour is still the popular French name). They were first introduced into England about 1617, when they were plentiful in France, but scarcely known in Italy. According to Parkinson, they were plentiful in England in 1629. The earliest English reference to the vegetable is in the second edition (1622) of Verner's "Via recta ad Vitam longam." No mention is made of it in the first edition, in 1620. The

author finds no grounds to accept the claim that the tubers were originally obtained by us from the Dutch. He considers that the "Jerusalem artichoke was certainly introduced into this country from France, as indicated above, about the year 1617." In that year Goodyer "received two small roots from Mr. Fraquevill, of London," from one of which he grew a "pecke of roots, wherewith I stored Hampshire." From his obviously French name it may be surmised that he had received the tubers from France.—Kew Bulletin, through Pharm. J., 104 (1920), 14.

Jujube Tree.—The fruits of the *Zizyphus jujuba* and its varieties are highly prized by the Chinese, who prepare from one of them a pleasant sweetmeat, the "Chinese date." From the fruit of several varieties found in Africa the natives prepare a kind of bread and a mild, refreshing beverage. *Z. Spina Christi* is supposed to have furnished the crown of thorns placed upon our Saviour's head at the time of His crucifixion. The *Z. vulgaris* is supposed to be a native of the Levant, and is very generally cultivated in the south of Europe, Italy, France, the Island of Cyprus, etc.

The tree is a compact grower, with numerous slender, spiny branches, the twigs of which are red. The foliage is small and glossy, and is arranged in delicate sprays, somewhat resembling the smilax.

The reddish-orange, sub-acid berries, which are produced in three years from planting, ripen in November and December. They are eaten both in the ripe state and when dried.—Confect. J., through Pract. Drug., 39 (June, 1920), 36.

Katoka Tree.—The commercial interest evinced this year in the edible seeds of the Katoka tree, imported from the West of Madagascar, led M. Jumelle to study the botanical origin of these seeds. The Katoka is an Artocarp which may be regarded as new and belongs to the genus *Treculia*. It is consequently akin to the Jack tree and bread fruit tree. The Katoka is a tree which may attain a height of 30 meters. Its trunk always deeply furrowed, as a smooth grey tinted bark. It gives a large quantity of edible seeds, but with a small percentage of oil.—Compt. rend., through Chem. News, 121, (1920), 322.

Kauri Gum.—*New Zealand Supply.*—A. A. Winslow states that since the close of the war this industry has received more attention than at any time during the last five years, with the result that it seems probable that greater quantities of kauri gum and its by-products will be produced than heretofore. A new method of gathering and grading the gum has lately been worked out whereby kauri peat swamps that are thoroughly pregnated with kauri gum in different stages of decomposition can be worked with reasonably good success. It is stated that if this process succeeds, and the indications are that it will, there can be more kauri gum secured from the deposits in the North Island than has been secured to date. It is claimed that any grade would be of sufficient quality for the manufacture of the lower grades of varnish and of linoleums. The gum could also be sold at a much more reasonable price than heretofore.—Comm. Rept., through Am. J. Pharm. 92 (1920), 417. (J. K. T.)

Kauri Gum.—*Oil from.*—Crude kauri gum distilled under commercial conditions in New Zealand yields an oil which is separated into motor spirit, 15 per cent., a solvent oil, 15 per cent., paint oil, 30 per cent., varnish oil, 30 per cent. and pitch the remainder.—Chem. & Drug., 92 (1920), 9, through Bot. Abs. (E. N. G.)

Laminaria and Tupelo Wood.—*Sponge Tents from.*—H. Braun discusses the history of dilating bougies made of the stems of *Laminaria* and tupelo wood and gives a microscopical and biologic description of the material. It is stated that the stems of *Laminaria hyperborea* are more suitable for making tents than those of *L. Cloustonic* and *L. stenophylla.* Tents made of tupelo wood, especially when they are varnished as is usually the case, are of little value, because they possess only a very slight swelling power. Requirements for laminaria bougies and distinctive characteristics from tupelo wood bougies are given.—Pharm. Zent., 61 (1920), 586, through Bot. Abs. (H. E.)

Lavender.—*Congress of French Growers.*—R. M. Gattefossé describes the Lavender Congress, which met in France in 1920. It was unique in the fact that it was one of the first occasions

where in France the practical planter met in conference with the chemist, the botanist and other scientists.—Chem. & Drug., 93 (1920), 1266.

Lemon.—*Sources and Properties.*—P. E. Hommell carefully traces the derivation of the word to its probable source. Consideration is given the properties, constituents and cultivation of the lemon.

The dietetic and medicinal values which are very numerous are due to its citric acid content. This invaluable acid was first isolated from the juice of lemon in the solid state, by Scheele in 1781.—Pract. Drug., Nov. (1920), 20. (F. H.)

Mace.—*Constituents of.*—Tschirch and Schlowsky have isolated from mace a new acid, macilenic acid, $C_{14}H_{26}O_{21}$, which when recrystallized from alcohol forms microcrystalline plates which melt at 70°. Another acid, macilolic acid, $C_{20}H_{40}O_{31}$, occurring as colorless scales and melting at 68°, was also found to be present. Mace further contains a phytosterol, melting at 131°, a coloring principle, and amylodextrin, but no glucosides. —Arch. Pharm., through Drug. Circ., 64 (1920), 102.

Male Fern.—*Synthetic Substitutes for Constituents of.*—Having noted that the constituents of male ferns were butyryl ethers of phloroglucin and that most tænifuge drugs contained derivatives of butyric and isobutyric acid, P. Karrer began work on the production of artificial butyrophenones. Among those made by him were:

1. *Phlorobutyrophenone* (2-4-6, trioxyphenyl propylketone), orange-red needles.
2. *Phloroisobutyrophenone* (2-4-6, trioxyphenyl isopropylketone), white needles.
3. *Methylphlorobutyrophenone.*
4. *Dimethylphlorobutyrophenone,* anhydrous needles.
5. *2-4 dioxy-6-methoxy-metatolyl propyl ketone,* or *isoaspidinol,* white crystals melting at 151.5°.
6. *Condensation product of* "3" with formaldehyde, microscopic needles melting at 212°.

Karrer reports that all of these are active as tænifuges.—Helv. Chim. Acta, through J. pharm. chim., 21 (1920), 282.

Manna.—*Source of Scriptural.*—E. M. Holmes discusses this interesting topic pointing out that the biblical description does not exactly coincide with any of the supposed sources even the most plausible one, *Lecanora esculenta.* On the other hand, the description of a fungoid food used by natives of the Tanganyika district of Central Africa, found in Swann's book, "Fighting the Slave Driver in Central Africa," agrees most closely with the scriptural account of the manna of the Israelites. Holmes believes it was entirely possible that such a fungus could migrate from Central Africa to Arabia and gives reasons for his opinion. He also expresses the hope that he will soon have samples of the Tanganyika fungus for examination.—Chem. & Drug., 92 (1920), 25.

Mastic.—*Production in Greece.*—The annual yield of Mastic in Greece is about 500 tons, exported chiefly to Germany, Austria, etc.—Chem. & Drug., 92 (2106), 750. (K. S. B.)

Matricaria Discoidea. — This matricaria species is recommended as a substitute for the more difficultly obtainable *Anthemis nobilis.* The articles by K. A. Karlsson include an historical review, the comparative chemical properties, and a macro- and microscopic anatomical study of the two plants.—Svensk Farm. Tidsk., 24 (1920), 517 & 533. (Bot. Abs.)

Mellitis Melissophyllum.—*Coumarin in.*—According to Guerin and Goris, coumarin has been so far found in thirty plants belonging to the most widely varied families. Without mentioning native species, it has been long known that it is to this principle that, after drying, the sweet-scented vernal grass (*Anthoxanthum odoratum*) the melillots and the fragrant woodruff (*Asperula odorata*) owe their agreeable perfume. With the Labiatæ, coumarin has only been mentioned in the essence of officinal lavender flowers. The plant examined by Guerin and Goris the results of which they reported to the Academy of Sciences last May, belongs to the same family; it is the *Melittis melissophyllum,* common in the woods of the Paris region, and whose large flowers with pure white corolla spotted with reddish purple are the admiration of all beholders.

In the wild state the melitte does not give any odor of coumarin, but under the influence of chloroform and ether, this odor developes at the end of two or three hours and becomes stronger still after drying the leaves subjected to this treatment, and which take on under these conditions, a deep green tint. It is only after several days that the odor can be detected in the leaves which have not been treated with chloroform or ether. Since the leaves of *Melittis melissophyllum* contain an emulsin the anesthetics used in the experiment should have caused the contact of a ferment and another body similar to a glucoside, which by reduplication, has set at liberty some coumarin, which the authors have been able to extract and to observe. The appearance of the fragrant principle would be, in reality, the result of a real plasmolysis.—L'Union Pharm., through Pharm. Era, 53 (1920), 241.

Momordica Cochinchinensis.—*Constituents of Seeds of.*—Corfield and Caird report that an examination of the fat contained in the seeds of *Momordica cochinchinensis*, a cucurbitaceous plant indigenous to India, Formosa and the Philippines, indicates that it possesses certain characteristics of drying oils, without the property of producing a varnish as does linseed oil. After heating, it behaves as a semi-drying oil, and admixed with drying oils, might be used in paints and varnishes. The seed kernels, by extraction with petroleum benzin, yield 47 per cent. of fat. The fat obtained from the heated seeds by expression, solidified on cooling to a pale green granular mass, easily liquefied. On exposure to air and daylight it oxidized to a whitish mass easily pulverized. In a film thus exposed at 100° C, oxidation was complete in three days and the fat had assumed a stiff, granular, gelatinous form, easily disintegrated. The constants of the fat, its fatty acids and alcohols, indicate that it consists chiefly of the glyceryl esters of saturated fatty acids. Some unsaturated fatty acids are present but no wax-alcohols. The seeds contain no alkaloids.—Chem. & Drug., 92 (1920), 9, through Bot. Abs. (E. N. G.)

These seeds which constitute the Chinese drug, *"muh-pich-tszo,"* are round or oval discs 3 to 4 cm. in diameter and 0.5 to 1 cm. thick. From the pulverized cotyledons by extraction with

ether, M. Nakao obtained a yellow drying oil, specific gravity 0.9191 at 25°; acid number, 4.82; suponification number, 180; and iodine number, 117.81. The yield of oil is about 40 per cent. The oil consists of the glycerides of stearic, palmitic, oleic, linoleic, linolic and ricinoleic acid. From the fat-free cotyledons by extraction with boiling alcohol were obtained trehalose and two saponins.—J. Pharm. Soc. Japan, through J. pharm. chim., *22* (1920), 109.

Monardas.—*A Study of.*—At a meeting of the New York branch of the American Pharmaceutical Association, E. Kremers discussed the results of twenty-five years research on the volatile constituents of the Monardas; a research that is indeed a credit to American pharmacy. While the investigations have cleared up many obscure points in the realm of phytochemistry and have resulted in the solution of many practical problems, notably the production of thymol, the writer states that he is relatively indifferent to all but the purely scientific aspects of the research.—J. Amer. Pharm. Assoc., 9 (1920), 1175. (C. W. B.)

Mowrah Meal.—*Detection in Insecticides.*—G. L. Keenan reports that this substance has been found in products intended for ant and worm eradicators and gives some characteristics of the powder. He gives uses of the seeds and oil, morphological description of the plant, *Bassia latifolia,* and appearance of the meal when examined under a microscope. Briefly summarized the ground meal resembles cocoa powder, being largely powdered cotyledons with occasional fragments of seed-coat. Microscopical examination of the powder in chloral hydrate solution shows yellowish brown masses occurring separately and in characteristic groups. It is possible to make a positive identification of the powder by means of a microscope.—J. Am. Pharm. Assoc., 9 (1920), 144. (Z. M. C.)

Mowra Flowers.—*Source of Alcohol.*—These flowers possess thick, juicy petals, rich in sugar. They are used by the natives of India as a foodstuff, and especially by the preparation by fermentation of an alcoholic liquor called daru or mohwa

spirit. A single tree will yield as much as 200 to 300 lb. of flowers in a year. The tree also produces a valuable oil-seed, which is exported in fairly large quantities to Europe. During the war the flowers were used in India for the production of acetone, the yield being said to be ten times as much as that obtained by distilling wood, which is the usual source of this substance. The demand for acetone in India in peace times, however, is not great, and large quantities of the flowers would be available for the manufacture of alcohol, and would appear to be an exceptionally cheap source of this material, as the yield is high, compared with that from potatoes and other materials commonly used, about 90 gallons of 95 per cent. alcohol being obtainable from one ton of dried flowers. It has been estimated that in the Hyderabad State alone there are already sufficient mowra trees for the production of 700,000 gallons of proof spirit per annum, in addition to that necessary for the local liquor requirements. It is suggested that the most profitable way of utilizing the flowers would probably be as a source of mixed motor spirit of the "natalite" type for use in India. That motor spirit can be produced on a manufacturing scale in India from mowra flowers has already been demonstrated, and it is stated that running trials with the spirit proved satisfactory.—Bull. Imp. Inst., through Pharm. J., 104 (1920), 339.

Mulatinhos.—*A Brazilian Edible Bean.*—C. Grimme describes this new food-stuff which is the seed of *Phascolus vulgaris*, subspecies *compressus*. This he finds free from hydrocyanic acid and when properly cooked furnishing a palatable food tasting like lentils. In the article, he gives results of his analyses of this bean as well as of Rangoon beans, peas and lentils.—Pharm. Zent., 61 (1920), 421.

Mustard Seed.—*Substitutes for.*—Viehoever, Clevenger and Ewing state that seed imported extensively in the United States as rape seed, but offered for sale as mustard seed is really *Brassica campestris chinoleifera*. Means of identification of seeds by microscopic examination are described in detail. Plants have been grown from seed and the characteristics established. The variety is closely related to the colza group (*Brassica campestris*).

The volatile oil obtained from the seed is crotonyl isothiocyanate. It is not a suitable substitute for mustard oil, either in respect of condimental, bactericidal, or medicinal values. The fixed oil is of the general composition of the rape oils, and amounts to more than 40 per cent. The seed should prove useful as pressed oil cake, the leaves as greens, and the plants as forage.—Full descriptions and illustrations are presented and taxonomic problems discussed. A bibliography of 52 titles is appended.—J. Agric. Res., 20 (1920), 117. (Bot. Abs.)

Mydriatic Drugs.—*Chemical Test for.*—Utz recommends that the following identification test be included in the description of the mydriatic drugs. The test is easily carried out by shaking about 1 gramme of the powdered drug with 5 mils of 5 per cent. sulphuric acid for three minutes, filtering and adding to the filtrate one drop of Koppeschaar's solution by which a more or less heavy precipitate should be formed.—Pharm. Zent., through Drug. Circ., 64 (1920), 258.

Nerium Odorum.—*Constituents of Root of.*—S. T. Gadre prepared an alcoholic extract of the air-dried roots of *Nerium odorum* collected in the winter and found its yield to be 13.7 per cent.

Distilled with steam, this extract gave a small amount of volatile oil, having the density, 0.866; $\alpha_D = -4.080$; $n_D = 1.40315$. Water dissolved 45 per cent. of the extract and this solution contained a small amount of a phenolic compound, a considerable quantity of a glucoside and some free glucose. That part of the extract that does not dissolve in water consists of two resins; a soft one containing formic, acetic, butyric, oleic, linoleic, palmitic and stearic acids and also a new alcohol *kanerol*, $C_{30}H_{50}O$, melting at 185 to 186°; and a hard one containing oleic, linoleic, palmitic and stearic acids as well as the alcohol, kanerol.—J. Ind. Inst. Sci., through J. pharm. chim., 22 (1920) 230.

Noli Palm.—*Constituents of.*—The oil palm of South America is the *Elaïs Melanococca*. It is analogous with the *Elaïs*

Guineensis of West Africa, but is smaller. The flesh of the fruit represents 16 per cent.; the nut 84 per cent., 62 per cent. of which is shell. The flesh contains 8.1 per cent. water, and 29 per cent. of oil, which is equivalent to 31.5 per cent. of oil in the desiccated fruit. The oil is a liquid of an orange yellow color, more fluid and lighter in color than the West African palm oil. The constants are as follows:

	Noli Palm Oil	W. Africa Palm Oil
Density	0.8636	0.8586
Point of solidification	33°.6	36°—46°
Acid index	19.7	—
Saponification index	199	196—205
Iodine index	83.5	53—57
Not saponifiable	0.7 per cent.	—
Soluble volatile fatty acids	0.7 "	0.86—1.87
Insoluble volatile fatty acids	0.5 "	—

The kernels contain 7.2 per cent. water and 45.4 per cent. oil, viz., 48.7 per cent. in the desiccated seeds; it is a solid pale cream fat.

	Noli Palm Oil	W. Africa Palm Oil
Density	0.8651	0.8731
Solidification	26°.9	20°—25°.5
Acid index	0.6	—
Saponification index	234	242—255
Iodine index	27.7	10.3—17.5
Not saponifiable	0.8	—
Soluble volatile fatty acids	1.4	5—6.8
Insoluble volatile fatty acids	3	10—12

— Mat. Grasses, through Chem. News, 121 (1920), 323.

Nux Vomica.—*Commercial Varieties of.*—Youngken and Slotter discuss the characteristics of Ceylon, Tellicherry, Madras and Cochin nux vomica. Their conclusions may be summarized as follows:

Variety of nux vomica	Specific gravity	Length of hairs (in microns)	Measurement of endoderm cells (in microns)
Ceylon	1.2102	770 to 1300	20 to 31 x 12 to 15
Tellicherry	1.3521	630 to 980	38 to 42 x 9
Madras	1.3024	630 to 700	28 to 31 x 9 to 12
Cochin	1.2433 to 1.334	630 to 980	28 x 9

The appearance of the hairs under polarized light is another useful means of identification.—Am. J. Pharm., 92 (1920), 538.

Œnanthe Crocata.—*Toxicity of.*—T. H. Thomsen describes a fatal case of poisoning in a man of forty. Roots were found in the bedroom where the man died which were identified as *Œnanthe crocata* (the classical name, from *oinos,* wine, and *anthos,* a flower—owing to the vinous scent of the flowers), "hemlock water drop wort," "horse bane," and "five-finger root." It is also called "water hemlock," but this name is more accurately applied to an allied poisonous plant *Cicuta virosa,* or "cow-bane." *Œnanthe crocata* is one of the most virulent of vegetable poisons, more deadly even than the more familiar *Conium maculatum,* or "spotted hemlock." It contains "œnanthotoxin," which causes convulsions by its action on the spinal medulla. The symptoms in this case were quite typical. The plant is very common along the banks of ditches and small streams in Argyll, where it is familiarly known as "hech-how."—Brit. Med. J., through Chem. & Drug., 93 (1920), 966.

The "Water hemlock-Dropwort" is notoriously deadly. Many fatal cases are known from eating the plant. Dr. Christison however made the discovery that in the vicinity of Edinburgh this species is, for some unknown reason, devoid of toxic properties. In County Wexford the author observed three herds of cows feeding on the plant by preference with no injurious effects. Cases are on record of cattle in other parts of Ireland killed by this poison. Some suggestions are made but no explanation offered.—Irish Nat., 29 (1920), 13. (Bot. Abs.)

Oil Bearing Nuts.—*Central American.*—There is practically no vegetable oil industry in Guatemala except such as is engaged in the production of a small amount of castor and citronella oils.

The seeds and nuts growing in that country from which oil may be extracted are the castor bean, citronella, cohune (corozo), coconut, sesame and avocado, according to a consular report.

The corozo nut is found only on the Pacific slope of Guatemala and the southern part of Mexico. It is estimated that 100,000 tons of kernels may be produced annually. Twelve tons of nuts will furnish one ton of kernel, and these kernels yield about 52 per cent. of oil.

The cohune (coquito or coquillo) nut grows only on the Atlantic slope, and it is estimated that 60,000 tons of kernels may be collected annually. Ten tons of nuts will yield one ton of kernels and the kernels will yield 67 per cent. of oil.

The oil yielded by corozo and cohune nut kernels is said to produce a better lather soap than other oils.

The avocado grows in great profusion in Guatemala. It has been stated that the avocado oil is suitable not only for soap making and similar uses but also makes a delicious salad oil.—Drug. Circ., 64 (1920), 114.

Olives.—*Botulism from and Its Prevention.*—T. A. Church notes that California has enacted rigid laws governing the ripe olive industry. This procedure is a direct result of the recent fatalities from botulism caused by this foodstuff. *Bacillus botulinus* occurs in the refuse around the packing plants and although the spores of this organisms are resistant to boiling water, it has been demonstrated that sterilization at 240° insures safety. The ripe olive industry in California was founded by Mrs. F. Ehmann and has grown until forty thousand acres are devoted to this crop. The trees grow in situations unfitted for other orchard crops and begins bearing fruit about the seventh year. The trees attain great age and those planted over a century ago are still bearing profusely.—Pharm. Era, 53 (1920), 293. (C. W. B.)

Olives.—*Botulism Due to.*—DeBord, Edmondson and Thom discuss the fatal outbreaks of botulism poisoning occurring during 1919. While it is agreed that the poisoning is due to the toxins produced by *Bacillus botulinus,* whether such toxins are present in ripe olives only or also in green olives is not yet settled. As to prevention of future outbreaks, it is recommended by officials

of the Bureau of Chemistry, that more efficient sterilization methods be employed, that the method of brine packing should be improved and that greater cleanliness should be observed during the handling of the olives.—J. Am. Med. Assoc., through Am. J. Pharm., 92 (1920), 465.

Opium.—*Ammonia Content of.*—A communication by James L. Thomson, at the evening meeting, in Edinburgh, of the Pharmaceutical Society of Great Britain. The quantitative estimations of seventy-one samples of opium, namely,—twenty-one Turkish, forty-eight Indian and two Persian showed the average percentage of NH_3 to be as follows:

Turkish 0.22; Indian 0.21, and Persian 0.18.

The estimation process was similar to that used in the "direct" estimation of ammonia.

The ammonia being in the presence of the various plant acids is in the form of salts of these acids. In order to decompose them sodium carbonate was used.

The general description of the process and apparatus is outlined in detail, together with a process for carrying out a blank test using pure ammonium sulphate.—Pharm. J., 105 (1920), 550. (L. N. B.)

Opium.—*Assay of.*—The determination of the alkaloids other than morphine and narceine in opium preparations of the pantopon type may be carried out, according to E. Anneler, as follows: Dissolve 1.5 grammes of the mixed hydrochlorides (for example, pantopon) by gently warming with 8 mils of water in a 150 mil flask. Add 90 mils of benzene, and gradually, with vigorous shaking, 0.5 grammes of anhydrous sodium carbonate. Shake vigorously at intervals during half an hour and add 5 grammes of anhydrous sodium sulphate. Shake for five minutes, and then add 0.5 grammes of powdered tragacanth. Shake again, and stand for half an hour. Filter off 80 grammes and evaporate to dryness on a water-bath; add a few mils of alcohol, again dry, and finally weigh. Narceine, like morphine, combines with the alkali and is not removed by the benzene. If the method is to be applied to powdered opium, then proceed as follows: Shake 6.66 grammes of the drug with 115 mils of water and 5 mils of

hydrochloric acid frequently during three hours, and filter through a Buchner filter. To 102 mils of the filtrate (=5.55 grammes of opium) add 10 mils of a 10 per cent. solution of sodium carbonate, and shake out with chloroform (20+10+10+10 mils). Dry the chloroform with a little tragacanth, filter into a flask, add 5 mils of alcohol, and evaporate to dryness. Dissolve the residue in 8 or 10 mils of 1 per cent. hydrochloric acid, add 100 mils of benzene, then 1 gramme of sodium carbonate, shake for 15 minutes, and complete as indicated above. In the mixed alkaloids other than morphine and narceine as above obtained, narcotine may be determined as follows: Dissolve the alkaloids in 6 mils of benzene at room temperature, add 1 mil of alcoholic potash (=0.14 to 0.16 gramme KOH), and allow it to stand for half an hour, frequently shaking. Transfer to a 100 mil separating funnel, rinse the flask with 3 × 10 mils of benzene and with 3 × 7 mils, 2 per cent. caustic soda, and shake. Separate the aqueous solution, and shake the benzene solution with 2 × 10 mils of 2 per cent. caustic soda. The mixed aqueous solutions are then washed with 3 × 5 mils of chloroform, transferred to a beaker, made up to 100 mils with water, 3 mils of 36 per cent. hydrochloric acid added, heated to 80°—90° for twenty minutes, cooled, transferred to a separator, made alkaline with sodium carbonate, and shaken out with benzene or chloroform. The benzene (or chloroform) solution is dried with a little tragacanth, filtered, evaporated on the water-bath, and the residue dried, redissolved in a little alcohol, again dried, and weighed. Papaverine may be determined in the benzene and chloroform solutions separated during the above process. Evaporate them to dryness in a small flask, dissolve in 10 mils of 1 per cent. hydrochloric acid, filter into a 30 mil beaker, washing with 3 × 5 mils of water. Add drop by drop 2 per cent. solution of ammonia until a permanent cloudiness appears, then add 2 grammes of sodium acetate, dissolve and stand 24 hours, stirring vigorously, and scratching the sides of the beaker from time to time. The papaverine is deposited as a glassy or amorphous mass. Filter the mother liquor through a 5.5 Cm. filter, wash with 3 × 5 mils of water, return the filter to the beaker, and dry. Dissolve the papaverine from the beaker, filter, and glass rod with warm alcohol, filter into a tared beaker, wash several

times with alcohol, evaporate, dry at 98°, and weigh. The accuracy of these methods was checked by determining the alkaloids in mixtures of known composition.—Arch. Pharm., through Pharm. J., 105 (1920), 287.

D. B. Dott points out the desirability of internationally established processes of assay for potent drugs is indicated. The various opium assays of different pharmacopœias are discussed. The process of the B. P. with certain modifications adapted from the Japanese and the French pharmacopœias gave more accurate results in the hands of various workers than had hitherto been observed with any other process. Final titration rather than the weighing of the purified morphine was preferred and the elaborate process of the U. S. P. was not approved.—Pharm. J., 104 (1920), 109, through Bot. Abs. (E. N. G.)

A. J. Jones points out two slight errors in the assay process suggested by Dott.—Pharm. J., 105 (1920), 550. (L. N. B.)

Jermstad briefly reviews the work on indicators used in titrating morphine in opium assays and reports on parallel titrations using iodeosin and methyl-red. His results show no differences of practical importance.—Schweiz. Apoth. Ztg., 58 (1920), 301. (H. A. L.)

Jermstad finds necessary as a basis of calculating the amount of morphine in opium, a determination of the amount of opium constituents soluble in a limited amount of water used is required. On the basis of 48 grammes of water for 6 grammes of opium, evaporate a certain amount (p. gm.) of opium filtrate and dry to a constant weight (m. gm.). Then the percentage of soluble matter ($\times$) = 800 m. (p.-m.) A mixture of 600 grammes of opium A (55.43 per cent. water-soluble) with 300 grammes of B (44.0 per cent.) and 250 grammes of lactose, for which mixture a solubility of 62.14 per cent. is calculated, yielded in 30 minutes maceration by two methods 66.71 per cent., after 1 hour 61.85 per cent., and upon complete extraction 72.40 per cent.; the last number has no relation to the morphine content. Jermstad recommends the determination of the amount of water-soluble opium constituents in the greatest possible number of commercial samples and the inclusion of the above method of determination among the official methods.—Schweiz. Apoth. Ztg., 58 (1920), 421. (H. A. L.)

H. W. Jones directs attention to the variable results due to loss of morphine crystals through the pledget of cotton used for their collection. He recommends using a quantitative filter paper instead of cotton. A number of tests show figures ranging from 2 to 11 per cent. above those obtained by the U. S. P. method. When the filter paper and its contents are transferred to the flask they give no more trouble than the cotton and it avoids the tedious addition of decinormal sulphuric acid in a way to wash down each adhering crystal.—J. Am. Pharm. Assoc., 9 (1920), 51. (Z. M. C.)

Opium.—*Effect of Heating.*—Macmillan and Tingle do not agree with the findings of Annett and Singh as to the change in morphine content produced by heating opium. The author's experimental data show that Persian opium lost more than 30 per cent. of its morphine on being heated for 96 hours but lost no more when the heating was continued to 288 hours. On the other hand, Indian opium lost only about 3 per cent. of its morphine on being heated for 192 hours, but when the heating was continued to 576 hours, the morphine loss had reached 30 per cent. As to the claim that boiling water does not remove all of the morphine from opium, the authors find this statement is true; a sample containing 9.35 per cent. of morphine yielding to water only 8.34 of its morphine.—Am. J. Pharm., 92 (1920), 810.

Opium.—*Empire.*—Before the war the medical opium trade was largely in the hands of Turkey, and the Indian opium poppy, although belonging to the same species (*Papaver somniferum*) as the Turkish, was found to have a lower morphine content. In order to replace the foreign product by one produced within the Empire, an effort is being made to produce by breeding experiments a race with a high content and a good yield. Leake and Pershad expect, by selection and crossing of the numerous Indian varieties of opium poppy, to produce a race with the desired qualities The preliminary paper deals with the numerous color varieties. The color patterns are independent of opium content, but are a useful index of purity in the various races. Chemical investigations have disclosed races yielding as much

as 18 per cent. morphine.—J. Genetics, through Pharm. J., 105 (1920), 292.

Opium.—*Microchemical Detection of.*—Rosenthaler gives the following methods: (1) place opium fragments in a formaldehyde-sulphuric acid mixture and observe purple-red or violet zones surrounding the lumps of dried milky juice. (2) Place opium in ammonium hydroxide and observe formation of characteristic morphine sphero-crystals, of which illustrations are given. They are soluble in dilute acetic acid and sodium hydroxide solution, and show the formaldehyde-sulphuric acid list plainly. They were obtained in a mixture containing 1 per cent. of opium in cane sugar. Thus far no other alkaloid containing has given these sphero-crystals. At all events, both tests combined should sufficiently identify opium.—Schweiz. Apoth. Ztg., 58 (1920), 313. (H. A. L.)

Opium.—*Pharmacy of.*—H. de Haan reports on a series of experiments undertaken with the object in view to find out a method to exhaust the drug more completely than is the case when applying the processes given in the Dutch Pharmacopœia. For preparing tincture of opium he used 40, 50, 60, and 75 per cent. alcohol and also alcohols of the same strength to which sufficient hydrochloric acid had been added to obtain a N/10 acid. The extract was prepared according to the official process, extraction with water, and also by extracting the drug with N/10 hydrochloric acid. The results showed that the addition of hydrochloric acid is of great advantage, because the alkaloids are almost completely extracted. When using acid it makes practically no difference what strength of alcohol is used. Poppy grown under varying conditions in the Hortus Botanicus in Amsterdam yielded varying quantities of opium assaying from 19.82 to 22.28 per cent. of morphine and 10.3 to 12.1 per cent. of meconic acid.—Pharm. Weekbl. 57, (1920), 1483. (H. E.)

Opium.—*Toxicological Tests for.*—Hankin and Chatterji report on 53 cases in which the organs were examined by the authors for opium. After describing methods of extraction (modified Stas-Otto process) the authors state that the only tests for mor-

phine found by them of use in testing viscera were (a) the porphyroxin test, (b) the Husemann reaction and (c) the urotropin test. It rarely happened that the same viscera extract responded to all three of these tests.—Analyst, through Am. J. Pharm., 92 (1920), 591.

Opium Alkaloids.—*Assay of the Zeisel Reaction.*—Gsell and Marschalko point out that five of the opium alkaloids, codeine, thebaine, papaverine, narcotine and narceine, contain the methoxyl group. These, the authors assay by use of the Zeisel methoxyl reaction; treatment with hydriodic acid, whereby the methoxyl group produces iodoform which can then be assayed with a special silver nitrate solution. For details, the reader is referred to the original paper.—Z. anal. Chem., through Pharm. Zent., 65 (1920), 68.

Opium Smoke.—*Constituents of.*—Frank Browne finds that the analysis of the smoke of *dross opium* extract, which is largely smoked in the East, indicates that morphine (0.016 gramme per 100 grammes of extract) is less abundant than in the smoke of chandoo opium (0.100 gramme in 100 grammes of the opium). As this dross opium extract is admitted by smokers to be stronger in effect than chandoo, this strength must be attributed to the pyridine bases, ammonia, hydrocyanic acid and such like substances rather than the morphine.

An interesting comparison is made with the constituents of tobacco smoke as follows:

From 100 gm. of	Carbon monoxide	Morphine	Nicotine	Ammonia	Pyridine	Hydrocyanic Acid
Dross Opium	c.c.	gm.	gm.	gm.	gm.	gm.
extract	0	0.016		0.395	0.147	0.0103
Tobacco 4124			1.16	0.36	0.15	0.004 to 0.010

Pharm. J., 104 (1920), 274, through Bot. Abs. (E. N. G.)

Origanum Majorana.—*Adulteration of.*—Griebel and Schaefer reports that *Origanum Majorana* is characterized by numerous multicellular hairs mostly curved and usually finely warty. *Thymus Serpyllum* has but few multicellular hairs; distinctive for this plant are the very short tooth-like hairs on the margin of the leaf. *T. vulgaris* has numerous short, one-celled, minutely

warty hairs, and also two-celled hairs with a bent terminal cell. The powdered leaves of *O. Majorana* have been adulterated with the two last-named, and as they are difficult to distinguish the above characters may be useful.—Pharm. Ztg., through Pharm. J., 104 (1920), 225.

Ormosia Dasycarpa.—*Alkaloids of.*—Hess and Merck describe *ormosine,* the alkaloid from this Venezuelan plant. Its physiological relationship to the morphine alkaloids has been demonstrated by Harnack. The authors find that it is not related chemically to these substances, and, indeed, occupies a unique position among alkaloids. In addition, they have isolated ormosinine from the same source, the yield of the former amounting to 0.15 per cent., and of the latter to 0.023 per cent., of the dried seeds. These substances, however, only represent a fraction of the total alkaloid content. The alkaloids are isolated by extracting the crushed seeds with alcohol, evaporating the solvent in a vacuum, and extracting the residue with water; the aqueous solution is made alkaline with ammonia, and shaken with ether. The ethereal solution is agitated with powdered sodium carbonate, after which the solvent is removed, leaving a crystalline residue, from which ormosinine is isolated by taking advantage of its sparing solubility in alcohol, whilst ormosine separates from the alcoholic solution on addition of water. Ormosine, $C_{20}H_{33}N_3$, crystallizes (with 3—4 H_2O) in long needles, m. pt. 85°—87° C., and is readily soluble in alcohol or chloroform. When preserved over sulphuric acid, it loses its water of crystallization, and forms a colorless gummy mass, which again becomes crystalline when brought into contact with water. At 100° C. it is converted into a viscous oil which does not recombine with water. Ormosinine, $C_{20}H_{33}N_3$, crystallizes in well-defined anhydrous cubes and short prisms, melting at 203°—205°. It is probably the anhydrous form of ormosine.—Ber., through J. Soc. Chem. Ind., 39 (1920), 80A.

Palm Seeds.—*Constituents of Two Madagascar.*—The seeds mentioned in this article are those of *Hyphæne Shatan* termed *Satranamira* and the *Dimaka* from *Borassus Madagascariensis.* Satranamira seed is similar to that of Dimaka and while both

possess the hardness of coroza, the former shows considerable elasticity. Analysis of the Borassus seeds gives the following results; moisture, 10.25 per cent.; fats, 0.51 per cent.; nitrogenous matter, 4.84 per cent.; soluble ash, 1.20 per cent.; insoluble ash, 0.54 per cent.; cellulose, 82.66 per cent. Analysis of Hyphæne shows; moisture, 12.10 per cent.; fats, 8.08 per cent.; nitrogenous matter, 5.95 per cent.; soluble ash, 1.01 per cent.; insoluble ash, 1.38 per cent.; cellulose, 71.48 per cent. The ether extract of Borassus is red while that of Hyphæne is yellow. The ratio of mannose to glucose in Borassus is 4.14:1 while in Hyphæne it is 2.56:1.—Chem. News, 121 (1920), 285. (C. W. B.)

Parsley.—*Use for Gall Stones.*—H. C. Kidd reports one case where a woman of 70 was relieved of gall stones without their passage by the administration of an infusion of parsley leaves; "a double handful of fresh parsley leaves was soaked in cold water, which was afterward brought to the boil, strained and allowed to cool."—Prescriber, through Am. J. Pharm., 92 (1920), 836.

Parsnip.—*Microchemical and Anatomical Study of Garden.*—H. W. van Urk in continuing his study on garden parsnip found that the alkaloid previously reported on is present in all parts of the plant. The root contains a fatty oil and an essential oil in addition to starch. Microscopically, garden parsnip resembles angelica root and cannot easily be differentiated from it. Cases of determatitis caused by the juice of the root appear to be due only to an idiosyncracy of hypersensitive persons.—Pharm. Weekbl., 57 (1920), 883. (H. E.)

Paspalum.—*Ergotism.*—This grass recently cultivated in Natal as stock food, has, according to D. T. Mitchell, produced ergotism in cattle. A large percentage of the Paspalum heads were found to be infected with *Claviceps Paspali.* From a series of experiments carried out at the Veterinary Research Laboratory it was noted that the initial symptoms appeared in each case on the second day after the infected heads were fed to the animals, and were characterized by muscular tremors, hypersen-

sitiveness, increased glandular secretion and increases in respirations and pulse rate. These symptoms were rapidly followed by incoordination of movement, lack of tone of the leg muscles, loss of appetite and constipation. Recovery was noted to commence about the fifth or sixth day.

Prophylactic measures consist of reaping and collection of the grass during the flowering season.—J. Dept. Agric., South Africa, 1 (1920), 422. (Bot. Abs.)

Passiflora.—*Value as a Hypnotic.*—H. Leclerc directs attention to the value of the alcoholature, or mother tincture, of the fresh plant of *Passiflora cerulea,* or of *P. incarnata* (prepared by macerating the crushed flowering herb in an equal weight of alcohol, 90 per cent.), in the treatment of insomnia, especially the sleeplessness following influenza. The author has found the administration of 30 minims of this at bedtime to ensure, in a large number of cases, a satisfactory night's rest. No ill effects or undesirable after effects have been observed. This preparation has been found to give better results than the ordinary tincture or the fluidextract of the drug. Presumably it contains more of the cyanogenetic active principle than those galenicals. Guignard has found that the leaves and flowers yield a notable proportion of hydrocyanic acid; the leaves 0.047 to 0.048 per cent., the flower buds 0.013 per cent., and the expanded flowers 0.002 per cent. Lindsay and Phares, in America, have indicated that the tincture and fluidextract are effective sedatives and antispasmodics. Bullington and Stapleton have had equally satisfactory results with preparations of *P. incarnata.* The drug has enjoyed long recognition among homœopaths, and its efficacy, with its freedom from ill effects, warrants a wider appreciation. The fluidextract has been given in doses of 5 grammes and the tincture in quantities of 2 to 5 grammes, without ill effects; but these doses are unnecessarily high. They may be reduced to one-half or three-fourths with advantage.—Bull. gén. Therap., through Pharm. J., 105 (1920), 220.

Pepper Substitute.—Lendner states that the powdered unripe fruits of bitter orange are extensively used as an adulterant for pepper, and recently a mixture of this powder and

piment (powdered capsicum?—ED.) has been placed on the market as a substitute for pepper. One of the characteristic constituents of unripe oranges is hesperidin, which occurs in the shape of more or less rounded yellowish masses. This substance, classed among the phloro-glucosides, is split up into rhamnose, glucose, and hesperetin; the latter, in the presence of caustic potash, yields phloroglucin and isoferulic acid. Upon the production of phloroglucin the author sought to discover a test for the presence of unripe orange powder by placing small amounts of the pepper to be examined on a small board of fir wood, and adding concentrated hydrochloric acid, in some cases after the addition of caustic potash. The wood was washed with water after an hour's action, and the formation of a reddish-carmine stain demonstrated the presence of phloroglucin. This test, however, did not yield good results in the case of a mixture of ingredients, and Lendner recommends a method permitting the recognition under the microscope of the characteristic structure of unripe orange by adding 4 per cent. caustic soda to the powder on a slide which dissolves the hesperidin, and after removing the excess of caustic soda by washing with water, one drop of Congo red solution is added. The unripe orange cells are recognizable by their red coloration, and by the shape of the collocytes.—Schweiz. Apoth. Ztg., through Chem. & Drug., 92 (1920), 748.

Phaseolus Lunatus.—*Poisonous Character of Seeds of.*—K. Wrede discussed the poisonous character, the histology and the chemistry of the Rangoon bean. A cross-section of the bean shows a layer of palisade cells, beneath which are funnel-shaped osteosclereide cells with broad intercellular spaces. Oxalate crystals are missing.

The beans contain a cyanogenetic glucoside, the dextrose ether of acetone-cyanhydrin and after hydrolysis, the material contains from 0.004 to 0.25 per cent. of hydrocyanic acid. When the HCN content is not more than 0.03 per cent., the beans can be safely used as food, provided they are soaked in water for 24 hours and then boiled for two hours in fresh water.—D-A. Apoth. Ztg., 41 (1920), 72.

German medical journals state that Professor Lewin, of Ber-

lin, warns that beans should not be allowed to be imported that contain more than 20 milligrammes of hydrocyanic acid in 100 grammes of the beans. There have been several cases of vomiting and diarrhea keeping up for ten or twelve hours after ingestion of imported beans of the *Phaseolus lunatus* species. This includes butter, sugar and lima beans and the bitter or Egyptian bean.—Drug. Circ., 64 (1920), 297.

Although the German government has prohibited the import of the bean on account of some cases of poisoning which had been reported, small quantities of the bean had found their way into Germany. Beythien and Hempel report on analyses carried out with several samples and found that the percentage of hydrocyanic acid in the bean is by far not as great as is generally reported. They found from 0.00075 to 0.0054 per cent. in these products. Furthermore, they state, most of acid is lost in boiling the bean.—Pharm. Zent., 61 (1920), 27, through Bot. Abs. (H. E.)

The results of analyses of numerous samples of the bean have shown that the hydrocyanic acid in it averages less than 0.02 per cent., that the acid is lost in boiling the beans with water and that the bean is, therefore, harmless. A few samples showed a rather high percentage of hydrocyanic acid, but these were derived from wild grown plants. From cultivated plants beans with considerably less acid are obtained.—Pharm. Zent., 61 (1920), 159, through Bot. Abs. (H. E.)

Phaseolus Lunatus.—*Hydrocyanic Acid Content of.*—Beythien and Hempel examined 226 samples of Rangoon beans of which 90 per cent. contained less than 0.015 per cent. of hydrocyanic acid. Of these, 73 per cent. contained between 0.006 and 0.015 per cent. No samples contained more than 20 mgms. per 100 grammes.—Pharm. Zent., 61 (1920), 295, through Bot. Abs. (H. E.)

For the determination of hydrocyanic acid in cyanogenetic beans H. Lührig recommends that 50 grammes of the beans be steeped in water for about 18 hours, then ground to a thin paste, acidified with tartaric acid, and steam distilled in an atmosphere of carbon dioxide; the distillate, amounting to about 400 mils, is collected in a receiver containing dilute silver nitrate

solution. The precipitate formed consists of silver cyanide, silver sulphide, etc. Ammonia is added and the mixture warmed until the silver cyanide has dissolved, the solution filtered, and the filtrate acidified slightly with nitric acid. After 18 hours the silver cyanide is collected, washed, dried, ignited, and the resulting metallic silver weighed. Nine samples of *Phaseolus lunatus* beans examined yielded from 5.1 to 23.4 milligrammes of hydrocyanic acid per 100 grammes. Treatment with emulsin previous to distillation did not appreciably increase the yield of hydrocyanic acid. When the beans had been washed and boiled (cooked) the consumption of three quantities of 200 grammes each did not produce any poisonous symptoms.—Chem. Ztg., through J. Soc. Chem. Ind., 39 (1920), 277A.

Pinus Pinea.—*Its Seed and Its Oil.*—Matthes and Rossie have studied this seed and the oil derived therefrom. The air-dried seeds contain 5.94 to 6.28 per cent. of water, 5.09 per cent. of nitrogen, 5.98 per cent. of sugar and 43.03 per cent. of oil. The latter obtained by cold pressing (yield, 27.33 per cent.) is bright-yellow mobile, odorless oil of pleasant taste; becoming cloudy at −14°; solidifying at −21°; having the density, 0.9198 at 15°; refractive index 1.4678 at 40°; optically inactive; acid number, 3.3; saponification number, 192.76 ester number, 189.46; iodine number, 124.97; Hehner number, 94.81; Reichert-Meissl number, 0.80; Polenske number, 0.69; acetyl number, 10.9; elaidin reaction, positive. The oil consists chiefly of the glycerides of palmitic, stearic, oleic and linoleic acids and has no pharmacological action upon animals, other than that of a fluid oil.—Arch. Pharm., through Pharm.-Zent., 61 (1920), 288.

Plum Kernels.—*Pharmaceutical Utilization of.*—G. Kassner describes his experiments with plum kernels. By expression, he obtained 20 per cent. of a golden-yellow oil resembling almond oil, having the refractive index, 1.4705 at 20° and iodine number 104.9. From the press cake by steam distillation, he obtained an *aqua pruni* containing 1.003 per cent. of hydrocyanic acid.—Arch. Pharm., through Pharm. Zent., 61 (1920), 56.

Poke Root.—*Use in Medicine.*—E. M. Holmes notes that little is known of the constituents of this drug. Various authorities

ascribe emetic, cathartic and alterative properties to it and several mention its use as a remedy in the treatment of tumors, epithelioma and inflammatory enlargements. The fresh root is used in the form of a poultice and produces a painful ulceration followed by dissolution of the morbid tissues. Leath and Ross in commenting upon this contribution by Prof. Holmes, cite further authorities on the uses of the drug and especially upon its action in the non-malignant forms of diphtheria.—Pharm. J., 105 (1920), 417 and 450. (C. W. B.)

U. A. Coates states that this drug is a powerful alterative and is serviceable in chronic rheumatism. The most effective preparation is the fluidextract and this is administered in 3 minim doses. Mention is made of an article appearing in 1862 in which numerous therapeutic and industrial uses of the drug are mentioned. The plant contains considerable potash and at one time was thought to offer possibilities as a source of this substance. The juice of the berries has been used as an indicator and as a dyestuff.—Pharm. J., 105 (1920), 454. (C. W. B.)

Polygala Senega.—*Morphology of.*—E. Steiger after a brief historical sketch of the discovery and development of the use of *Polygala Senega* gives a detailed description of the plant, including growth, appearance, structure, etc. The article is illustrated with many photographs of cross sections, parts of the plant, etc. It covers 73 pages and therefore cannot well be abstracted.—Ber. dtsch. Pharm. Ges., 30 (1920), 43. (H. H. S.)

Potato.—*Introduction in France.*—In a French work, "Principia," there is an interesting account of the introduction of the potato as a food in France, by Parmentier, pharmacist at Hôtel des Invalides in 1771.—Pharm. J., 105 (1920), 303.

Potatoes.—*Separation of Its Tyrosinase into Two Constituents.*—H. Haehn has been able to separate tyrosinase of potatoes into alpha-tyrosinase, which is sensitive to heat and an activator which is not sensitive to heat. Separated neither of these constituents act as oxydases upon tyrosin, but combined they show the oxidizing action of tyrosinase.—Ber., through J. pharm. chim., 21 (1920), 443.

Primula Officinalis.—*Glucosides of.*—Goris, Mascré and Vischniac report a study of the two glucosides from this plant, *primeverin* and *primulaverin*. These are isomeres hydrolyzing to a biose *primeverose* and a second body; the aglycone of primeverin being the methyl ether of methoxy-resorcylic acid and that of primulaverin being the methyl ether of meta-methoxysalicylic acid. Primeverose melts at 209°, is multirotary, first have $\alpha_D = +22.7°$ and then $\alpha_D = -3.43°$. In their paper they suggest structural formulæ for both glucosides. —Compt. rend., through J. pharm. chim., 21 (1920), 284.

Primrose.—*Substitute for Senega.*—R. Wasicky publishes an article recommending the collection and use of primrose (*Primula veris* and *Primula elatior*) in place of senega root. The roots and rootlets are collected, washed and dried without any special precautions. During this process the glucosides primeverin and primulaverin are partly hydrolyzed and the roots assume an odor like anise and methyl salicylate.

The active ingredients are saponins, which are present in large quantities. Primula root is said to be about 5 times more effective medicinally than senega root. Used in infusion (1 to 2 per cent.) good results were obtained.—Pharm. Zent., 61 (1920), 373. (O. M.)

Purgative Drugs.—*New Tests for Some.*—In this paper by E. H. Grant, new tests are described for the identification of scammony root, jalap, leptandra, gamboge, podophyllum, senna, rhubarb, cassia fistula and chionanthus, when present in galenical preparations. The tests for gamboge, podophyllum, senna, rhubarb and chionanthus are quite characteristic. "The other tests while being far from conclusive are of value in assisting to identify the drugs." The result sought in the tests for scammony, jalap and leptandra is the development of a fruity odor, in the others a color change.—J. Am. Pharm. Assoc., 9 (1920), 766. (Z. M. C.)

Pyrethrum.—*Insecticidal Value of the Flower Heads at Different Stages of Development.*—N. Passerini find that all parts of the plant have an insecticidal value, however, the powder, produced

from well developed heads, is more rapid in its action. The ligulate flowers have a higher value than the mature heads and, consequently, this factor must be taken into consideration in the determination of the time of gathering the plants.—Nuova Gior. Bot., 27 (1920), 1. (Bot. Abs.)

Quercus Cerris.—*Tannin of Gall of.*—M. Nierstein has studied this Slavic type of nutgall which is produced by *Cynips gallicis* upon *Quercus cerris* and which is called in its habitat "sisarca" and "gubacs." The tannin extracted from it is hygroscopic, has a rotation, $\alpha_D = +31.8°$ to 36.2° in alcoholic solution and +8.4° to 11.8° in acetone solution. Hydrolyzed with sulphuric acid it yields glucose and ellagic acid.—J. Chem. Soc., through J. pharm. chim., 21 (1920), 365.

Quillaja.—*Examination of It and Its Substitutes.*—Cofman-Nicoresti and Tallantyre have examined the bark of *Q. Saponia, Q. Smegmadermos, Q. Peppigi* and *Q. lancifolia.* Reich states that *Q. Saponaria* is the only Chilian species, *Q. Peppigi* and *Q. Smegmadermos* being regarded as synonymous of this species. Though Don describes *Q. lancifolia* as a different species because it has dentated leaves with a cut at the apex, Gay has found on the same tree of *Q. Saponaria* leaves of widely different shapes and forms. The saponin yield averaged in official bark 10 per cent., in quilled bark 9.8 per cent., and in supposed false barks 9.5 per cent. Extraction of saponin is described and an improved process for preparing tincture of quillaja by extraction with water and preservation by the addition of 20 per cent. of alcohol is included, also a discussion of the poisonous properties of saponin is presented.

The microscopical appearance of the three barks did not appear to show any marked differences. The accompanying illustration (Fig. 15) shows a transverse section of the genuine bark, illustrating the checkered arrangement of brown bast fibres embedded in the white wood; also the medullary rays with three and four rows of cells. Crystals of calcium oxalate are numerous, and a brownish substance is present in the parenchymatus tissue, which according to Kobert, should be saponin—Pharm. J., 105 (1920), 95. (E. N. G.)

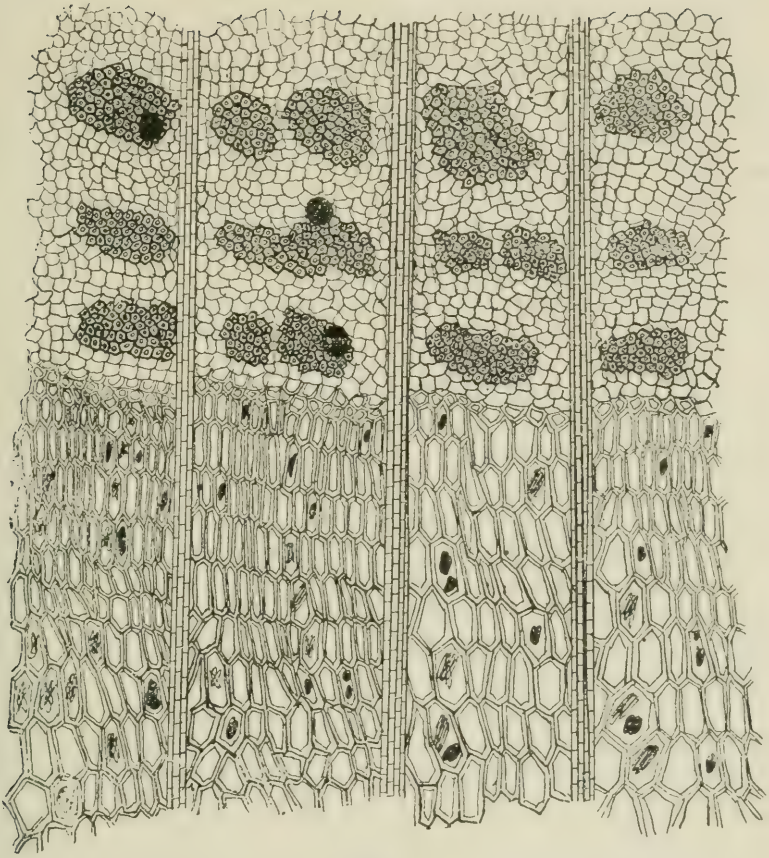


Fig. 15

Ragweed Pollen.—*Proteins of.*—Heyl and Hopkins call attention to the fact that in considering any drug from a pharmaceutical point of view, two distinct schools of thought are always in evidence. First, the progressive school which is largely dominated by chemistry and to whom pharmacy owes much in the matter of the isolation or preparation of pure or crystalline principles. Secondly, there is the conservative group, dominated by the simpler pharmaceutical methods and favoring the preparation of galenical extractions. They say that it is well to understand that however desirable the progressive results due to

chemical investigation in all cases may be, that there are a number of drugs (e. g., ergot and digitalis) the actions of which we do not comprehend, and for which it were well if the pharmacists adopted and the clinician used, a strictly galenical product until the chemist has worked out the problem involved. Where the pharmacist attempts to precede the chemist as has been done with both the drugs mentioned, there arises a chaotic condition which actually retards the advance of knowledge.

Ragweed pollen is such a drug. The uncertain state of our knowledge does not justify the preparation or use of pure principles from this drug, even though at present we may view the albumin fraction as the constituent of chief interest.

The conclusive work of Osborne and Harris on ricin lead to the thought that in an analogous manner the pure pollen albumin is probably the so-called toxin in this case, but when we find not 40 per cent. as in the rye pollen, but only 1 to 2 per cent., we feel more than ever the logic of adhering to the galenical extract until the required information shall have been gained.—J. Am. Chem. Soc., 42 (1920), 1738. (J. L. M.)

Ramie Fiber.—*Use as Surgical Dressing.*—A process has been devised for the manufacture of a completely degummed and bleached ramie fiber which has been utilized for making surgical dressing. Experts of the American Red Cross service who have tested dressings so made report that "sterilization showed no change in the absorbability of the ramie, and very little change in the consistency of the material, with less tendency to pack than in the case of absorbent cotton." Army officials have pronounced the material to be, as compared with absorbent cotton, lighter, longer in the fiber, equally convenient in handling, and superior in absorbent qualities. According to reports sent to Commerce Reports by Consul Ross E. Holaday, Manchester, England, samples submitted to English surgeons and hospitals have elicited favorable commendation. Full details of the process of degumming the fiber are not available, but the invention seems to provide for turning out not only surgical dressing but fibers for use in the textile industry.—Pharm. Era, 53 (1920), 365.

Red Rose.—*Tannin of.*—An exhaustive examination of red

rose petals by Josiah C. and Bertha L. DeG. Peacock, and their astring principle compared to the tannin of other drugs, leads the writers to the following conclusions:

1. Gallic acid is not present. 2. Gallotannic acid is not present. 3. Quercitannic acid is not present. 4. A substance called quercitrin by former investigators is present. 5. That there is present a considerable amount of a tannin. 6. This tannin contributes both the astringency and the bitterness of the drug. 7. This constituent has not been previously reported. 8. As a means of distinguishing this tannin until classified through chemical composition it may as well be called "rosatannic acid." —Proc. Penna. Pharm. Assoc., 45 (1920), 162. (L. S.)

Resins.—*Determination of the Saponification Number of Dark Colored.*—When the solution of the resin is not too dark, H. Salvaterra recommends saponifying 2 to 4 grammes of the resin in the usual way, then adding a little less than the necessary amount of n/2 acid (the approximate amount necessary for neutralization having been determined by a preliminary test) and sufficient alcohol to obtain 200 mils of solution. The liquid is then filtered and 100 mils of the filtrate is titrated to the end-point using a 2 per cent. alkaline solution of alkali blue 6B as indicator. When the resin acids are soluble in alcohol, an excess of n/2 acid can be added to the soap solution and the excess titrated back with n/2 alkali. If the soap solution is very dark, Stiepel's method should be applied. One to four grammes of the resin are saponified in a 500 mil graduated flask with n/2 alcoholic caustic potash solution, 32 mils of 6 per cent. barium chloride solution and 300 mils of previously boiled and cooled distilled water are added and the mixture is refluxed for one hour. After cooling, water is added to the mark and the mixture is filtered. In an aliquot part of the filtrate the excess of alkali is titrated back, using phenolphthalein as indicator. A blank test with the same amount of barium chloride should be made.—Chem. Zeit., through Pharm. Weekbl., 57 (1920), 330. (H. E.)

Resins.—*Classification of.*—Tschirch reports that the conifer acids seem to fall into two groups; their types are the several abietic acids (A) and pimaric acids (B). "A" differs from "B,"

in melting point and crystal forms, also by showing a different ester number although esters seem to be absent. "Enol" formation with replaceable hydrogen probably accounts for this reaction in group "A." Acid number of "A" from the resin obtained from *Pinus palustris* is 188 and 192. Saponification number 237.7 and 257.6. Acid numbers from resin of *Pinus maritima*, is 171.5 and 171.7; saponification number 174.2 and 172.5. Canada balsams contains resins belonging to both groups. Tschirch (1900) has shown that "A" and "B" are both isomeres of $C_{20}H_{30}O_2$ and are derivatives of retene, $C_{18}H_{18}$, which has a phenanthrene and probably a terpene nucleus according to Bamberger. Among artificial resins are given bakelite, "resinit" albertol and coumarone resins. Tschirch suggests the synthesis of resins from retene of coal tar and the conversion of resinous by-products of organic synthesis into artificial useful resins.—Schweiz. Apoth. Ztg., 58 (1920), 485. (H. A. L.)

Resins.—*Qualitative Distinction of Mixed.*—Mixed resins free from colors, oils or solvents can be distinguished according to H. Wagner by the following method:

(I.) The resin is insoluble or sparingly soluble in turpentine.

1. Very soluble in alcohol, insoluble in fixed oils, sparingly to insoluble in hydrocarbons, hard to melt or impossible to melt.
2. Very soluble in alcohol with red color, soluble in benzol. *Dragon's blood.*
3. Partly soluble in alcohol, more soluble in amyl alcohol, sweet odor on ignition. *Copal.*

(II.) The resin is soluble in turpentine.

A. It melts or softens on water bath.

1. Yellow to dark brown, nearly insoluble in alcohol and aliphatic hydrocarbons; very soluble in benzene hydrocarbons, softens at 30° to 50°; melts at 50° to 70°.
2. Yellowish white, soluble in hot alcohol, aromatic incense-like odor on ignition. *Mastic.*
3. Yellow, tough, sticky, soluble in alcohol, odor like sealing-wax upon ignition. *Turpentine.*
4. Yellow to brown, soluble in alcohol, soften at 70°, pitch-like odor on ignition. *Rosin* (colophony).

5. Brown, very soluble in alcohol and hot borax solution, melts easily, odor like sealing-wax on ignition. *Shellac.*
6. Black, softens easily, partly soluble in alcohol, very soluble in benzol; bituminous odor. *Asphalt.*

B. The resin does not melt on water-bath.

1. Very soluble in alcohol, pitchlike odor on ignition. *Hardened rosin.*
2. Colorless to yellow, partly soluble in alcohol and benzin, soluble in benzol and fixed oils, melting point about 120°, intensely sweet, afterwards pitchlike odor on ignition. *Damar.*
3. Partly soluble in alcohol, soluble in amyl alcohol and fixed oils, melting point above 180°, intense sweet odor on ignition. *Copal.*

—Pharm. Zent., 61 (1920), 385. (O. M.)

Resins.—*Refractive Indices of.*—J. Greger reports on the refractive indices of 39 resins at 18° C. He finds they run n_D = 1.525 to 1.670 and that the individual indices are proportion to melting points, hardness, density and other physical data.—Chem. Umschau, through Pharm. Zent., 61 (1920), 439.

Rhubarb Leaves.—*Poisoning from.*—J. Angerhausen calls attention to symptoms of acute poisoning and even death caused by the ingestion of considerable quantities of rhubarb plant. This is to be attributed to oxalic acid, chiefly in the form of acid potassium oxalate, found in excessively large quantities in some kinds of the rhubarb plant. Assuming the lethal dose of oxalic acid to run as high as 10 grammes for adults and 3 to 4 grammes for children, he shows that enough of the plant is at times eaten to cause pronounced symptoms of poisoning to result. Particular danger lies in the ingestion of the plant in the desiccated form. On the average ¼ per cent. of the potassium salt was found in the stalks and ½ per cent. in the leaves of the plant. Angerhausen recommends treatment of the plant with calcium carbonate, thus forming an insoluble calcium salt. If for each 100 grammes of stalks 0.30 grammes of calcium carbonate, and 0.70 grammes for each 100 grammes of leaves be employed, the danger of poisoning is entirely obviated. Furthermore if the plant be first washed thoroughly with hot water

and then allowed to drain, and this procedure repeated, the danger of poisoning is greatly lessened.—Z. Unters. Nahr. Genussm., 39 (1920), 81. (G. C. D.)

Rhus Venenata.—*Histology and Chemistry of.*—Youngken and Slothower reports on the histology of the stem and leaves of specimens of *Rhus venenata,* collected by the authors. The structure of these organs can be best explained by the accompanying illustrations (Fig. 16 to 19):

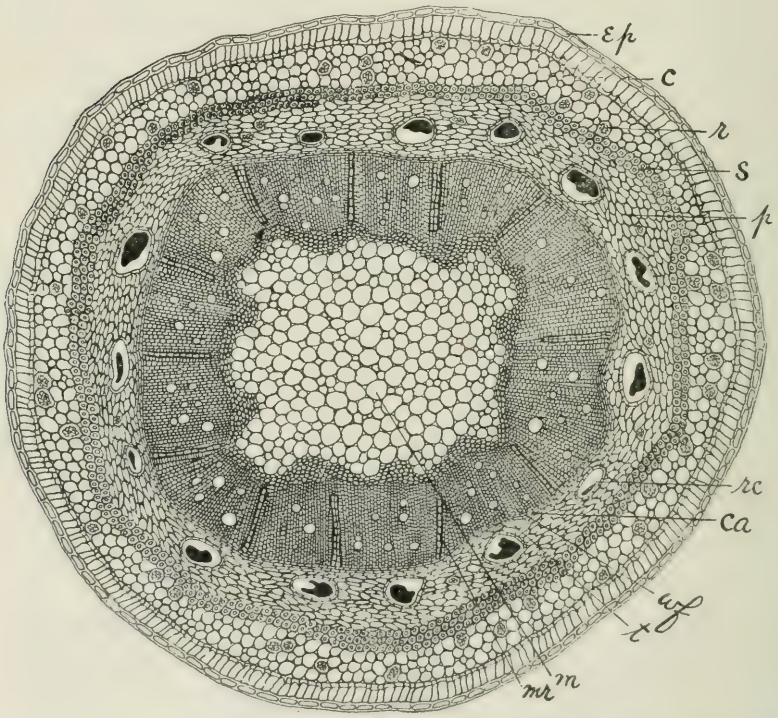


Fig. 16. Transverse section of young stem of Rhus venenata. Epidermis (*ep*); cortex (*c*); calcium oxalate crystals (*r*); stereomatic tissue in the pericycle (*s*); phloem (*p*); resin canals (*rc*); cambium (*ca*); xylem (*x*); wood fibers (*wf*); and tracheæ (*t*) of the xylem; medullary rays (*mr*); pith (*m*).

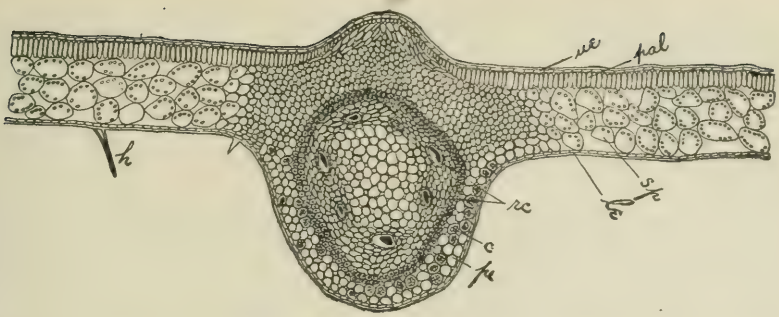


Fig. 17. Transverse section through the midrib and portion of lamina of *Rhus venenata*. Upper epidermis (*ue*); palisade parenchyme (*pal.*); spongy parenchyme (*sp*); lower epidermis (*le*); resin canals (*r. c.*); calcium oxalate crystals (*c*); pericylic fibers (*pe*); hairs (*h*).

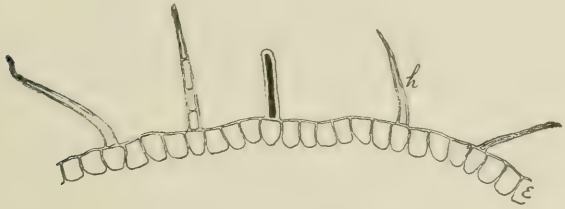


Fig. 18. Vertical view of portion of dorsal epidermis of *Rhus venenata* lamina. Epidermal cells (*e*); non-glandular hairs (*h*).

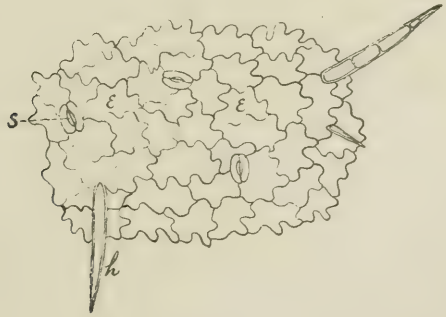


Fig. 19. Surface view of dorsal epidermis of *Rhus venenata* lamina. Hairs (*h*); wavy-walled epidermal cells (*e*); stomata (*s*).

After discussing the various theories of Rhus poisoning, the authors report that petroleum ether extracts from the leaves of *Rhus venenata,* the blistering resinous principle; and that after the leaf has been exhausted with petroleum ether and then extracted successively with ether, alcohol and water, these respective extracts contain no poisonous ingredient. The authors found the irritating resin, in the resin canals of the stem and of the midrib and also in the hairs of the lamina. A characteristic reaction for the resin is the black color produced when it or tissue containing it is treated with alcoholic potassium hydroxide solution.—Am. J. Pharm., 92 (1920), 695.

Rice Polishings.—*Alkaloids in.*—F. Hofmeister extracted from rice an alkaloidal substance, termed "oridine," which showed antineuritic activity and which on further purification became inactive. It is isomeric with betaine and valine, and is supposed to be related to the pyridine and piperidine groups.—Biochem. Zsch., through J. Soc. Chem. Ind., 39 (1920), 581A.

Robinia Pseudacacia.—*Urease of Seeds of.*—Pin Yin Yi describes experiments performed to determine the ability of Robinia urease to split up urea. He proved that at 80°, it was possible to obtain an almost quantitative yield of ammonia by means of his method. The results of variations in time and quantity of Robinia seed power used is shown by means of tables. Attempts on the part of the author to isolate the urease from the seeds are described but do not show encouraging results. Attempts to extract this active principle showed that a solution of sodium acetate was most suitable for this purpose. A number of experiments were also conducted to determine the action of this urease upon urea derivatives.—Ber. dtsch. Pharm. Ges., 30 (1920), 178. (H. H. S.)

Rosin.—*New Solvents for.*—Goldschmidt and Weiss point out that trichlorethylene and tetrachlorethane are excellent solvents for rosin, dissolving from 91.6 to 98.5 per cent. of the raw product.—Chem. Umschau, through Pharm. Zent., 61 (1920), 238.

Rubber.—*Assay of.*—Pontio's method for estimating rubber, consisting in precipitating the rubber from a chloroformic solution by alcohol gives unsatisfactory results, according to Utz, because it is very difficult to remove the liquid from the rubber clot. Satisfactory results are obtained by Marquis and Heim's process, which consists in shaking a solution of one gramme of rubber (free from resins) in 100 mils of chloroform with 8 grammes of concentrated sulphuric acid for three minutes and then pouring the chloroformic solution into alcohol. A flocculent precipitate is thus obtained which can easily be collected, washed and dried. Good results are also obtained by Vaubel's method. Twenty mils of a solution of 2 grammes of rubber in 100 mils of chloroform are treated in a stoppered flask with 5 grammes of potassium bromide, 200 mils of dilute hydrochloric acid (1:10), 40 mils of a 2 per cent. potassium bromate solution and a particle of iodine. The mixture is allowed to stand for 30 minutes and the excess of bromine is titrated back with standardized sulphite solution. Carbon tetrachloride can be used instead of chloroform, but in this case the caoutchouc compound is so finely divided as to make the titration rather difficult.—Z. angew. Chem., through Drug. Circ., 64 (1920), 64.

Rubber.—*Detecting Synthetic in Mixtures.*—C. Harries proceeds as follows: The rubber is swollen in ten times its quantity of chloroform and then treated with 5.5—6 per cent. ozone until a sample no longer decolorizes bromine; the solution is cautiously evaporated below 20° in a vacuum, and after drying in a vacuum for several days the ozonide is decomposed by boiling for an hour with twelve times its weight of water. Ozonides of caoutchoucs derived from isoprene and dimethylbutadiene decompose fairly smoothly with very little resin formation. A little of the filtered solution is treated with a few drops of ammonia solution, then acidified with acetic acid and boiled, when, except in the case of abnormal sodium caoutchoucs, the vapors show Knorr's pyrrole reaction and redden a pine shaving which has been wetted with hydrochloric acid. Ordinary Elberfeld isoprene caoutchouc yields 46 per cent. levulinic aldehyde and 60 per cent. levulinic acid together with formic acid and a little acetonylacetone. The sodium-carbon dioxide iso-

prene caoutchoue of the Badische Co. behaves similarly but more easily yields acetonylacetone and succinic acid. The estimation of the various decomposition products is effected in the manner which has been described earlier. "Normal" dimethylbutadiene-caoutchouc yields acetonylacetone almost quantitatively. The most difficult estimation is that of butadiene-caoutchouc; this yields only succinic dialdehyde, the phenylhydrazone of which is unstable but is readily converted by dilute hydrochloric acid into a white polymeric base melting at 184°—185°. Vulcanized rubbers should be first extracted with acetone and then ozonized in the presence of calcium carbonate; in this way the resulting aldehydes and ketones are preserved from resinification, whilst the sulphuric acid and the organic acids are found in combination with calcium.—Gummi Ztg., through J. Soc. Chem. Ind., 39 (1920), 307 A.

Saffron.—*Shipping of.*—The plant that produces saffron is an autumnal or fall crocus, so named to distinguish it from its near ally, the spring crocus which it closely resembles. It is a native of southern Europe, western Asia, and is extensively cultivated in Spain, France, Italy, and Cashmere. The product derived from this plant, saffron, is the dried orange-colored stigmas; it requires about 4,000 of these to make an ounce. The product is used in various ways—as a medicine, in the manufacture of cordials and liquors; as a coloring matter; and in parts of Europe as a flavoring and coloring ingredient in cooking.

After the harvest the saffron is packed in a crude state in matting trunks containing about 50 kilos (1 kilo = 2.2046 pounds) each and hauled by donkeys or ox teams to the shipping point, Verria, a town of about 20,000 inhabitants. There the trunks are loaded into freight cars and carried to Saloniki, 50 kilometers (1 kilometer = 0.621 mile) away. On arriving at Saloniki the trunks are unpacked and the saffron is put through a process of refining which removes sand and other foreign substances by sifting. The product is then ready for the market. It is packed in tins and these tins in turn in wooden cases holding 20 to 25 kilos; sometimes cases of 50 kilos weight are shipped.

The saffron crop from this district is sent mostly to France. Some finds its way to England. Little is sent to the United States, which is supplied from Spain. Since 1919 American buyers have shown an increased interest in the Macedonian product, however.—Pharm. Era, 53 (1920), 336.

Saffron.—*Spanish Thistles as Adulterant of.*—A consignment invoiced as saffron was recently held up at Savannah by the United States Customs on suspicion as to its genuineness. A sample was sent to the Agricultural Department for examination, where on analysis the flowers were found to be a common plant similar to the Scotch thistle, colored with red and yellow dyes, weighted with saltpetre, borax, and glycerin, flavored evidently with saffron oil, and finally crinkled to resemble the dried crocus stigmas. The stuff was refused entry.—Chem. & Drug., 93 (1920), 1662.

Sage Leaves and Stems.—*Relative Content of Volatile Oil and Ash in.*—Before the war, almost all sage came from Austria. After blockade of Austrian ports two other species, one from Greece and one from Spain, were imported. Since the war Salvia officinalis is obtainable but shipments have contained stems in excess of 12 per cent. American sage was grown in increasing amounts and did not contain an excess of stems but growers reported excessive ash. Arno Viehoever and Jos. F. Clevenger undertook to verify this and determine the cause. They found that the leaves contain about three times as much oil as the stems. The herbaceous parts of the plant yielded more volatile ether extract than the woody portions. The glands and glandular hairs containing the oil are found only in the epidermis of leaves, petioles and herbaceous stems. The leaves usually contain more ash than stems and since the stems are low in volatile oil and consequent spice value a limitation is justified.—J Am. Pharm. Assoc., 9 (1920), 563. (Z. M. C.)

Sambucus Racemosa.—*Oil of Seed of.*—Matthes and Rossie have obtained from elder seed a golden-yellow, odorless mild-tasting oil having a density of 0.9215 at 15°; melting point — 13°; N_D = 1.4710 at 25° and 1.4655 at 40°; optically inactive,

acid number, 3.11; saponification number, 192.5; ester number, 189.45; iodine number, 116.95; Hehmer number, 94.95; Reichert-Meisel number, 0.77; Polenske number, 0.75; elaidin reaction, positive. The oil contains 22 per cent. of solid and 74 per cent. of liquid fat acids, the latter consisting of 10 per cent. of linolenic acid, 32 per cent. of linoleic acid and 55 to 58 per cent. of oleic acid.—Arch. Pharm., through Pharm. Zent., 61 (1920), 275.

Saponaria.—Kobert proposes the use of soap root as a substitute for senega.—Chem. & Drug., 92 (1920), 539.

Sarcocolla.—*Properties of.*—Tschirch describes sarcocolla as a secretion of the stem of the Persian plant, *Astragalus sarcocolla,* used in healing wounds and in eye trouble. It is analogous to tragacanth but has a bitter sweet taste, due to sarcocollin, which is analogous to glycyrrhizin. Tschirch finds sarcocolla soluble in water and that it is precipitated by alcohol. Starch, bassorin and saponin are also present. A crystalline substance was separated. This was soluble in water and alcohol and insoluble in methyl alcohol. Historical notes are given.—Schweiz. Apoth. Ztg., 58 (1920), 113. (H. A. L.)

Schleichera Trijuga.—*Constituents of the Fruit and Seeds.*—N. N. Sen Gupta has studied the constituents of the various parts of the fruit with special emphasis on its use as a cattle food.

The author has likewise recorded the results of his investigation on the cyanogenesis of the seed.

The fat which doubtless has many important properties has only attained commercial value (under the name of kon oil, kusum oil or macassar oil) in the manufacture of hair oil.—J. Soc. Chem. Ind., 39 (1920), 88T. (F. H.)

Scopola Carniolica.—*Use in Austria.*—H. Fühner reports that in Galicia and other Austrian provinces where it grows, the peasants use scopula root as a domestic remedy as a sedative in colic and rheumatism and as a love potion.—Ther. Monatsh., through Pharm. Zent., 61 (1920), 123.

Seaweed.—*Use as Cattle Food.*—A new food for cattle, prepared from seaweed by a process of Danish origin, is found on

analysis to be as follows: protein 13.12 per cent.; fat, 1.07 per cent.; digestible carbohydrates, 66.76 per cent.; cellulose, 9.0 per cent.; mineral salts, 9.03 per cent.; water, 5.0 per cent.—Chem. & Drug., 92 (1920), 583. (K. S. B.)

Senna.—*Detecting Adulteration with Palthé Senna.*—Vamossy writes that Palthé senna can easily be distinguished from *Cassia acutifolia, C. angustifolia* and *C. obovata* by moistening the leaves with concentrated sulphuric acid by which they are colored deep red, while the leaves of true senna become at most colored yellowish-brown.—Pharm. Monatsh., through Drug. Circ., 64 (1920,) 382.

Shepherd's Purse.—*Use as a Hemostatic.*—During the war, in the absence of ergot and hydrastis, the Germans found the herb, *Capsella bursa-pastoris* a useful substitute as a hemostatic. Kroeber (*Heil und Gewürzpflauzen*) recommended it highly, employing it as a fluidextract, for which he sets standards. Bodinus also recommends it; his analysis showing presence of citric acid, tannin, allyl mustard oil and a trace of *bursic acid*. He was unable to find alkaloids. Wasicky questions the styptic value of the herb. His analysis failed to show any active constituents, except the presence of an unusual quantity of potassium salts (ash, 10 to 15 per cent., of which 40 per cent. is K_2O). He raises the question as to whether the supposed styptic action is due to the action of the potassium ions upon the muscle fibers and warns as to the danger of excessive potassium therapy.

On the other hand, Boruttau and Cappenberg find in the herb a number of active constituents, including choline and tyramine.—Apoth. Ztg., through Pharm. Ztg., 65 (1920), 647.

Sium Sisarum.—*A New Food Product.*—It is reported that the roots of *Sium sisarum* being rich in sugar contents can be used as an article of food.

The roots grow well in clay ground that has been fertilized with cow-manure the year previous. Best results are obtained if the seeds are soaked in water during December, sowed in pots and kept in a moderately warm room till March. The germinated seeds are transferred to the hot bed and transplanted to the field in May. Late in Fall the roots are collected.

The roots of plants from which the seeds have been removed before ripening are best.—Neuste Erfind. u. Erfahr., through Pharm. Zent., 61 (1920), 386. (O. M.)

Squill.—*The Collection and Preparation of.*—Henry G. Greenish in his paper on *Urginea Scilla* quotes La Ferlas' description of the two varieties. Although the red bulb is said to contain less mucilaginous matter and of inferior quality, it is preferred by the French. The white squill is used exclusively in London. It is imported from Malta. The red is obtained chiefly from North Africa. Methods of preparation preparatory to shipping are detailed in the article.—Pharm. J., 105 (1920), 284. (F. H.)

Squill.—*Constituents of.*—E. Buschmann finding it impossible to successfully extract the active principles from dried squill because of the large amount of syrupy material, worked on the fresh bulb and extracted from an aqueous extract choline. From the alcoholic extract by successive extraction with petroleum ether, ether and chloroform, he obtained *xanthoscillide*, melting at 117 to 118°; *scillosterol,* melting at 163 to 164°; a phytosterol, melting at 134°; an oil having the density 0.9248 and the iodine number 57 to 60; and a phytosterol glucoside melting at 290° with decomposition.—Arch. Pharm., through J. pharm. chim., 21 (1920), 364.

St. John's Wort.—*Action on Live Stock.*—This herb, *Hypericum perforatum,* has become established in some localities in Australia, the largest being in Victoria with two infested districts in New South Wales. Considerable complaint arose from poisoning by this plant. Symptoms of poisoning are described by Sydney Dodd as they occur in the field and as a result of feeding experiments. Injury is lacking if the animals are not exposed to the sun, as the latter causes injury to the skin which is sensitized by the poison of the plant. The plant is most poisonous at time of flowering.—J. Comp. Path. Therap., 33 (1920) 105. (Bot. Abs.)

Storax.—*Purified.*—As authentic samples of this drug show the density at 15°, 1.035 to 1.060; acid number, 107 to 129; ester number, 59 to 71; and saponification number, 171 to 187; P.

Bohrisch points out that these extreme variations make it difficult to detect presence of adulterants.—Pharm. Zent., through Chem. Abstracts, 14 (1920), 3296.

Storax.—*American.*—In view of the scarcity and very high price of Levant styrax and the imperative need for recognition of the American species the experimental work being done is commendable. Ray E. Spokes reviews the literature of storax and reports the results of considerable experimental work. The valuation of storax is rather difficult. Cinnamic acid content was determined by the bromine absorption method. In estimating esters there was variation in results. Cinnamic acid and styracin were separated and several means of differentiation employed. The volatile oil styrol was separated and tested. Mr. Spokes was unable to find *styrogen*, a white amorphous body isolated by some investigators. Storax is difficult to collect and the author explains the way it is done. American storax is distributed from Connecticut southwest to Missouri and south to Florida, Arkansas and Oklahoma. Unlike the Levant species the American variety seems to be uninjured by insects.—J. Am. Pharm. Assoc., 9 (1920), 1055. (Z. M. C.)

Storax.—*American Liquid.*—F. E. Watermeyer gives some very interesting facts concerning *Liquidambar Styraciflua*, a tree of Central America. Its valuable secretion, known as Copalme, was used as a source of supply in Europe for perfuming incense, ointments and medicine. Its prototype *Liquidambar orientalis* formed the chief source of supply for the entire world.

The balsam-bearing tree is recognized by the excrescences which may or may not contain balsam. The pockets contain 2-8 pounds.

Although the American product is not official, its superior quality has given it a place alongside of the Asiatic variety.—Am. Perfumer, through Am. Drug., 68 (Feb., 1920), 20. (F. H.)

Stramonium Leaves.—*Quality of Commercial.*—E. M. Holmes finds it quite remarkable that it is difficult to obtain genuine stramonium leaves; i. e., the leaves of *Datura Stramonium*, especially in view of the fact that the plant grows abundantly in

a wild state over many large areas in temperate climates and is also easily cultivated with the production of a large crop of leaves on any soil containing plenty of vegetable debris.

Adulteration of European stramonium with the leaves of *Xanthium strumarium* and *Carthamus helenoides* was noted in 1901 and again in 1916. In 1918 the leaves of *X. macrocarpum* were extensively substituted for stramonium leaves from Spain. Of eight samples of Spanish herbs recently submitted for inspection only two were genuine.

Why *X. macrocarpum* leaves are thus substituted is a question, unless it is from pure ignorance on the part of the Spanish collectors, for the plant and leaf are widely different from stramonium, it is no more abundant in most districts than stramonium and the work of collecting is as great as that of stramonium.

The author pleads for an extension of English drug cultivation and government inspection of imported and exported drugs from the standpoint of British trade.—Chem. & Drug., 92 (1920), 908, through Bot. Abs. (E. N. G.)

Strophanthus.—*The Sulphuric Reaction for.*—Gilg and Schuster discuss the details of this well-known test. They find it essential to use 8 parts of strong acid and 2 parts of water. Stronger acid will not produce the color reaction, while weaker acid produces dirty indistinct colorations. The sections must be treated dry, as water, for reasons stated above, spoil the reaction. The authors conclude that the reaction represents some form of hydrolysis of the strophanthin. Of all of the numerous strophanthus species only *S. Kombé, S. Arnoldianus* and *S. hispidus* give the characteristic green color. These three can be distinguished by their microscopic and macroscopic peculiarities. —Ber. dtsch. Pharm. Ges., through Pharm. Zent., 61 (1920), 66.

Sugar Cane.—*Constituents of Wax of.*—A sample of cane wax extracted by J. E. Z., Bosz from the mud resulting from the defecation of juice in a Java factory was found to have melting point 60°—62°, acid value 47.3, and saponification value 177. Cholesterol was absent. The fatty acids separated by saponifying, adding hydrochloric acid, and shaking out with benzene, had

melting point 54°, and appeared to be an eutectic mixture of palmitic and stearic acids. In the liquid obtained on steam-distilling the product of saponification, myricyl alcohol, caproic acid, and formic acid were identified. Acetic, benzoic, and cinnamic acids could not be detected.—Arch. Suikerind, through J. Soc. Chem. Ind., 39 (1920), 825A.

Wood Tars.—*Varieties Sold in Morocco.*—Massy has examined samples of wood tar sold by vendors in the market place of the town of Meknes. There are two general types offered for sale, a fluid tar from cedar wood and a semi-solid tar that is supposedly from a species of juniper. Physical and chemical examination of these tars with comparisons with a genuine cedar tar and with oil of cade show that the Moroccan samples only slightly resemble these two products.—J. pharm. chim., 21 (1920), 433.

Tea.—*Origin of.*—History has it that in the ninth century the Chinese lived in a land laden with germs. Those who drank raw water fell ill, while those who drank boiled water remained well. So they adopted the habit of drinking boiled water and improving the flavor with tea. This only proves how Flavor superinduces, not a thirst, but a Desire. The aqueous fluid may be all right as a conveyor, but it takes the esthetic taste and flavor to make it palatable. Hence our soft drinks—*par excellence.*—Pract. Drug., 39 (Nov. 1920), 18.

Thyme.—*Spanish.*—Of the two dozen species of Thymus which occur in Spain, *T. hyemalis* furnishes Spanish verbena oil, *T. Mastichina* yields oil of wood marjoram and *T. vulgaris* and *T. zygis* produce thymol. Because of the recent exportation of *T. zygis* in considerable quantity for thymol extraction, interest attaches to it. The variety *gracilis,* only, contains thymol (*T. zygis,* L. var. *gracilis,* Boiss) and care must be exercised to separate it from *T. zygis,* var. *floribunda.* The botanical, geographical and horticultural differences are pointed out.—Chem. & Drug., 92 (1920), 999, through Bot. Abs. (E. N. G.)

"Tiby."—This drink, incorrectly called "kephir," is produced by adding kephir grains to a diluted sugar solution. Kayser states that the fermented product obtained from a 5 per cent. sugar solution contains 2 to 3 per cent. of alcohol and about 0.7 per cent, of lactic acid.—Ann. falsif., through J. pharm. chim., 22 (1920), 69.

Tomato.—*Vitamines in Canned.*—Hess says that canned tomatoes is the most serviceable antiscorbutic for artificially fed infants. It is well borne, comparatively inexpensive, and is available. Canned tomato may be considered from a nutritional standpoint, as a palatable solution of the three vitamines. Hess recommends it unreservedly in doses of 1 ounce a day. By substituting it for orange-juice a great saving has resulted.—N. Y. J. Med., through Chem. & Drug., 93 (1920), 1269.

Tormentilla Erecta.—*Use in Dysentery.*—H. Caesar finds tormentilla root as effective a remedy in dysentery (especially in animals) as krameria, catechu, or tannin and its derivatives.—Puk, through Pharm. Zent., 61 (1920), 428.

Tragacanth.—*Origin and Etymology.*—An unsigned article says tragacanth was described by Theophrastus as coming from Crete, the Poloponnessus and Media. It has been supplied through Smyrna, although that from Kurdistan and Persia is now official. Plant-etymology is exemplified in the common name "gum dragon"; first it was gum adragant, then dragant, next dragan and ultimately dragon.—Nat. Drug., 50 (1920), 41. (C. M. S.)

Tragacanth.—*Collection of.*—A report from the Revenue Commissioner in Mesopotamia mentions that the most valuable of the gums collected is tragacanth, which is produced by tapping small shrubs which grow all over the mountains of Southern Persia and from thence through the entire mountainous region which runs northwest along the frontiers of Mesopotamia, comprising such areas as northern Arabistan, the Luristan-Pust-i-Kut country, and Kurdistan. The most important collecting center for Bagdad is Suleimanaya, the capital of the Suleimanaya

district of Kurdistan, situated about 180 miles to the northeast of Bagdad. The gum is called "Al-kitirah" in Arabic. The method for tapping the bush is as follows: The Kurds first burn all the leaves off the bushes, then expose the roots, cut incisions in the roots, and leave for a week or so; they then return and collect the gum which exudes from the roots. The first tapping produces gum of the best quality, second and subsequent tappings gum of yellow colors and inferior quality. Excessive tappings weaken, and may sometimes kill the bushes. The Kurds bring in the gum to Suleimanaya where it is bought by local merchants who export it to Bagdad on pack transport in caravans, and sell to Bagdad merchants. These in turn export to England and foreign countries. Local authorities sometimes levy a tax on the market price in Suleimanaya.—Am. J. Pharm., 92 (1920), 38. (J. K. T.)

Turpentine.—*New Method of Extracting.*—F. M. Ryder says that E. S. Oliver, an industrial chemist and specialist on wood products, has given out some valuable and interesting information in the turpentine industry. He has made a study of the methods of extracting the maximum amounts of resin from trees without injury to the growing tree. Under the old system of scarifying the bark and collecting the resin after the more volatile elements had become oxidized by contact with the air it was not possible to obtain more than 17½ per cent. bulk of turpentine. In Canada the highest production in any of the Eastern plants was 15½ per cent. Under Mr. Oliver's tests the lowest he has received was 33 per cent. or about 1 per cent. more than in Germany where the resin by-product industry has developed to an art. The process is a constructive, not a destructive one. One must read the original article to get full information on the subject.—Natl. Drug., 50 (1920), 394. (C. M. S.)

Uzara.—*What Is It?*—Henry G. Greenish's quotation from several abstracts concerning the new remedy for dysentery discovered by Mr. H. W. Hopf includes an historical account leading to the discovery of uzara.

The abstracts cover the methods of preparation, botanical source and comparison between uzara and its synergist.—Pharm. J., 105 (1920), 474. (C. W. B.)

E. M. Holmes further states that this preparation used for dysentery is reported to be derived from a plant in the Asclepiadaceæ growing in Central Africa. It is a small shrub with strongly developed root and long thin twigs, long narrow leaves in pairs and occurs in the African Lake District. According to H. W. Hopf, the discoverer, the plant bears a red inconspicuous flower. The dried root is in the form of hard pieces 2½ cm. thick, yellowish-gray in color, of agreeable odor and bitter taste. Prof. Holmes states that the nearest plant to meet this description is *Schizoglossum Shirense,* although there is a discrepancy in that the flowers of this plant are purplish-brown and the plant belongs to the Compositæ.—Pharm. Jour., 105 (1920), 507. (C. W. B.)

Vanilla Beans.—Wallace Mawbey has contributed an interesting paper relating to the discovery history, habitat, growth, seasoning, assorting and flavor development of the vanilla beans. —Pract. Drug., 39 (Nov. 1920), 60. (F. H.)

Vanilla.—*Popularity of.*—It has been estimated that three times as much vanilla flavor is consumed as all the other flavors added together. The plant is a climbing parasitic orchid and although cultivated in the East Indies, the native Mexican variety is considered the best. The characteristic flavor and odor are secured by curing the unripe fruit. The curing operation includes sweating and drying and result in the beans becoming covered with a crystalline deposit of vanillin. This substance comprises from 1.69 per cent. to 2.75 per cent. of the weight of the fruit. Mexican vanilla contains less vanillin than other varieties but is better flavored. Alcohol extracts all the flavoring principles and the extract is much improved by aging. None of the artificial extracts approach the genuine in flavor and odor.—Pract. Drug., 39 (Jan. 1920), 37. (C. W. B.)

Vetiver.—*"Sweet Grass" in Trinidad.*—This tropical "sweet grass" is obtained from *Vetiveria Zizaniodies* or *Andropogon squarrosus.* It has a strong persistent perfume which makes it

desirable for sachets, perfumed fans and other souvenirs particularly during the Christmas season. It is believed to be as effective as camphor in banishing moths from clothing. An effort is being made to distil the perfume from the roots for commercial purposes.—Nat. Drug., 50 (1920), 183. (C. M. S.)

Viburnum Prunifolium.—*Some Constituents of.*—Heyl and Barkenbus call attention to the fact that black haw as officially described in the latest Pharmacopœia as the dried bark of *Viburnum prunifolium* "without the presence or admixture of more than 5 per cent. of wood or other foreign matter." They say that this description has probably completely altered the nature of the pharmacopœial drug because it had previously been defined as the dried bark of the root. They say they do not know of any experimental reasons for this change and hold that such alterations are unjustifiable unless at least some chemical data can be produced to substantiate the similarity. For use in their present investigation they employed the dried root bark of the authentic drug and was carefully inspected by their colleague, Dr. S. H. Harvey. It was collected in Michigan and was picked over by hand, so that the examination was conducted upon a selected sample.

The proximate analysis showed the drug contained 7.1 per cent. moisture and 7.3 per cent. ash. Ligroin extracted 7.1 per cent.; ether 10.4 per cent., alcohol, 18.7 per cent. The paper contains the results of the examination of the various extracts. —J. Am. Chem. Soc., 42 (1920), 1744. (J. L. M.)

White Pine Bark—*Adulteration with Elm Bark*—C. O. Ewing reports upon having found an instance of intentional adulteration of white pine bark. The appearance of the two barks is quite different except as to color. The ground bark should also be easy to detect by microscopical examination since the monoclinic prisms of calcium oxalate are so striking.—J. Am. Pharm. Assoc., 9 (1920), 253. (Z. M. C.)

Xanthoxylum Budrunga.—*Crystalline Compound from Bark of.* —H. Dieterle reports that the bark of *Xanthoxylum Budrunga* contains about 0.25 per cent. of an alcoholic compound, $C_{23}H_{40}O$,

related to lupeol and alstol, and named xanthosterol by the author. Its reactions and certain of its derivatives are described. —Arch. Pharm., through J. Soc. Chem. Ind., 39 (1920), 81A.

Yage and Yocóo.—B. Baldo commenting upon the medicinal resources of Colombia mentions two especially interesting plants described in an official report by Z. Bayón. The first, termed "yagé", by the Indians contains, according to the fantastic tale, the principle *telepathin* and is said to produce the psychic phenomenon, telepathy. The second, termed "yocóo" in dialect, is apparently used by the natives in place of cocoa and in a similar manner. Tribes using this article are singularly free from malaria and enjoy exceptional health.—Am. Drug., 68 (Apr. 1920), 15. (C. W. B.)

Yeast Growth and Alcoholic Fermentation.—It is stated that the methods used by the physical chemist to measure rates of chemical reactions can be applied to investigate the process of alcoholic fermentation by living and growing yeast cells. These methods are valuable in results which not only give new information but also make it possible to bring into line results obtained by other methods. In a paper by Slator, yeast growth and alcoholic fermentation are considered from this point of view. Oxygen is necessary for yeast growth, and lack of oxygen soon makes itself felt and is the main retarding influence when yeast cells develop from a few million cells per mil to the maximum growth of about 100 million per mil. Measurements of the logarithmic constants of growth under anaerobic and aerobic conditions have been made. In these experiments malt wort behaved as if it contained a certain amount of combined oxygen available for yeast growth. The results are not in agreement with H. T. Brown's conclusions (1914) that growth under anaerobic conditions is due entirely to oxygen previously absorbed by the yeast. Alcohol also acts as a retarding agent, but usually growth stops in a fermenting solution before the alcohol concentration is sufficient to have much influence.—Am. J. Pharm., 92 (1920), 105. (J. K. T.)

Yohimbe Bark.—*Origin of.*—At the 1920 meeting of the German Naturalists and Physicians, W. Brandt discussed the botani-

cal origin of this drug. Gilg considered it as the bark of *Corynanthe Yohimbe,* but Pierre later decided that the tree from which it is derived differed sufficiently from the Genus Corynanthe, to justify the creation of a new genus, which he called *Pansinystalia.* Brandt agrees with the Pierre contention and decides that the plant yielding yohimbe bark should be called *Pansinystalia Yohimbe.* It is closely allied to South American Genera, Cinchona, Ladenbergia, Remijia and Pimentelia.—Pharm. Ztg., 65 (1920), 765.

Zacaton.—Large shipments of zacaton or broom root have been made from Vera Cruz in the past few months on all ships going to Spain, France and England, commission merchants stating that they receive better prices there for this product than in the United States. The plant known botanically as *Epicampes macroura,* is an unusually hardy, heavy cropping perennial grass of profuse growth found in many parts of Mexico. It has never been cultivated to any extent. The root is the valuable part of the plant and may be gathered at any time of the year. The root is dug and subjected to a cleansing process, the thin skin and dirt removed, and the root then bleached to a pale yellow color by exposing it to the action of sulphur fumes. The roots are sorted, the thin and straight or slightly curly roots being preferred. These are worked up into brushes. The roots are packed in bales for shipment, Vera Cruz merchants paying from .80 to $1 peso per kilo for the same. An export duty of five cents Mexican currency per kilo gross is imposed on the root.—Pharm. Era, 53 (1920), 111.

C—Animal Drugs and Products

Glandular Products.—*Informal Talks on.*—These very interesting articles run through four numbers and present the subject in a concise and most understandable manner. The specific subjects discussed include: suprarenal glands; Addison's disease; adrenalin; thyroid glands; parathyroid glands; pituitary glands; sex glands; thymus and pineal glands.—Bull. Pharm. 34, (1920) 73, 76, 118, 121, 151, 152, 205, 207. (C. M. S.)

Insects.—*Use in Medicine.*—J. T. Lloyd discusses the ancient medical use of such insects as spider and the angle-worm and raises the question as to whether their present disuse is not due largely to esthetic reasons. He points out that many crude vegetable drugs are now largely replaced by their alkaloids and other active constituents and he suggests the possibility, that future chemical work may produce from unattractive insects, therapeutically active principles.—Am. J. Pharm., 92 (1920), 714.

Poisons.—*Animal Sources of.*—Flury discusses interestingly the various poisonous substances obtained from animals, such as tyranime; adrenaline; cantharidin, which resembles anemonin; crotalin, bufotalin and lufagin, which act as digitalis bodies, and animal sapotoxins, such as are found in the bee sting. He raises the question whether the so-called toxalbumins are not in reality protein combinations of some of the animal poisons that are already known.—Berl. Klin. Wsch., through Pharm. Zent., 61 (1920), 679.

Ant.—*The Poison of.*—Tschirch reports that the poison of the ant is an enzyme-like toxin and that the formic acid acts only as an activator of and protective for the poison, which is destroyed by alkalies. He believes that the poison of other insects is of a similar nature and that an immediate treatment of bites by insects with ammonia water is therefore rational.—Schweiz. Apoth. Ztg., through Drug. Circ., 64 (1920), 257.

Bee Sting.—*The Toxin of.*—F. Flury has hydrolyzed this toxin with hydrochloric acid and has obtained therefrom an indol derivative, choline, glycerin, phosphoric acid, palmitic acid, a non-saturated fatty acid of high molecular weight, a volatile fatty acid (presumably butyric) and a non-nitrogenous body, which seems to be the active substance.—Arch. Exp. Path. Pharmacol., through J. pharm. chim., 22 (1920), 438.

Beeswax.—*Cholesterol Esters in.*—P. Böhrisch found that a sample of East African beeswax examined by him contained 0.61 per cent. of cholesterol esters and a sample of East Indian beeswax 0.22 per cent. Since ordinary (German) beeswax contains

0.6—0.7 per cent. of these esters, the difficulty with which the foreign waxes saponify cannot be due to their presence.—Pharm. Zentralh., through J. Soc. Chem. Ind., 39 (1920), 71 A.

Cantharides.—*Assay of.*—Louis DuBois gives a new method for the assay of cantharides, which is similar to that of Baudin, modified only so to make it a complete extraction method, instead of an aliquot one. The author states that it is preferable to the present U. S. P. method. The chief objection to the U. S. P. method is that lower results for both "combined and free" cantharidin were obtained, than the amount obtained for "free cantharadin" alone by his method. The crystals obtained by the U. S. P. method were dark and resinous, while those obtained by the author's method were clean and white.—Am. J. Pharm., 92 (1920), 157. (Bot. Abs.)

Civet.—*Adulterated.*—J. Nivière reports on a sample of civet that had been adulterated with wool-fat and glucose and on another that contained 68 per cent. of talc.—Bull. Soc. Chim., through J. Soc. Chem. Ind., 39 (1920), 763 A.

Cobra Venom.—*Effect of.*—The excretion from the salivary glands of the cobra is regarded as one of the most deadly animal fluids known to science. Freshly excreted it is a pale yellow liquid, rather viscid, with a sp. gr. of about 1.046. Exposed to air it evaporates quickly, leaving a shining, granular residue, without definite crystalline form. The dried venom dissolves in water, and gives a slight acid reaction. Many investigations have been made of this poison, with varied results. E. Faust claims "that the essential constituent of the cobra poison is a nitrogen-free substance, belonging pharmacologically to the group of the picrotoxins, sapotoxins, and sphacelo-toxins."—Am. J. Pharm., 92 (1920), 425. (J. K. T.)

Eggs.—*Preserving.*—Jones and DuBois have devised two new methods of preserving eggs. The first was to protect the eggs by a preliminary coating before sealing with a gasoline solution of an aluminum soap. The best agent for this purpose is diluted sulphuric acid. When eggs are immersed in the acid

effervescence continues for about ten seconds and ceases as a coating of calcium sulphate is formed in the pores of the egg shells. The eggs are then dipped, without drying, into the aluminum soap solution and placed in a special dripping rack. Eggs so preserved are sweet, and no taste of gasoline can be detected in them. The extra cost of the preliminary sealing, either in time or money, is negligible.

The necessity of double dipping is a weakness and a better solution of the problem was found. Gasoline is composed largely of pentane, a practically tasteless, odorless and colorless liquid, which dissolves aluminum soap.

By fractional distillation of gasoline practically odorless and tasteless pentane may be produced. The cheapness with which pentane can be made and the facility with which it can be used to dissolve aluminum soap seem to make this solution of the problem satisfactory in every way.—Drug. Circ., 64 (1920), 384.

Egg Yolk.—*Cause of Darkening on Boiling.*—Tinkler and Soar find that the dark line of discoloration seen on the surface of the yolks of hard-boiled eggs is caused by the formation of ferrous sulphide by the liberation of sulphuretted hydrogen from the decomposition of a sulphur compound in the egg white, and its action on the iron contained in the yolk.—Biochem. J., through Pharm. J., 105 (1920), 250.

Honey.—*Artificial.*—During the war large quantities of artificial honey were used in Germany. The products of different firms did not show much uniformity, a thin fluid being much in evidence. For the production of the thick variety, the water content and the degree of inversion of the cane sugar are matters of great importance. The water content must not exceed 22 per cent. and the inversion must be complete to within 5 per cent. The inversion proceeds best when at least 0.1 per cent. of formic acid is present. The strongly acid taste of the product is removed by neutralizing with sodium carbonate. On economic grounds, thick artificial honey is an indispensable product in Germany, and it is recommended that legislation be introduced to prevent confusion between natural and artificial honey.—Schweiz. Chem. Ztg. through J. Ind. Eng. Chem., 12 (1920) 389.

Honey.—*Presence of Invertin.*—A. Caillas' experiments convince him that invertin is a constituent of pure honey.—Compt. rend., through J. pharm. chim., *22* (1920) 71.

Honey.—*Presence of Melizitose in.*—It has been known from ancient times that during droughts bees collect mannas when the floral nectar is scarce. Turkestan manna contains the rare sugar, melizitose, and the authors, Hudson and Sherwood (See Year Book, 1918, 479), have already reported on the presence in the manna from the Douglas fir of 70 per cent. of melizitose. During 1919, they received from Port Royal, Pa., a sample of honey containing instead of dextro-glucose crystals, crystalline melizitose in quantities ranging from 10 to 20 per cent. E. T. Wherry investigating the source of this melizitose found that the bees of that region collect a sweet fluid deposited on the twigs of *Pinus virginiana* by the insects *Tonmeyella parvicorni* and *Lachnus pineti.* This fluid contains melizitose. The paper gives details as to the extraction and analysis of the melizitose.—J. Am. Chem. Soc., *42* (1920), 116.

Hypophysis.—*Crystalline Principle from.*—E. Leschke has isolated from the hypophysis, a substance that lessens the urinary excretion.—Biochem. Zsch., through Pharm. Zent., 61 (1920), 276.

Hypophysis Extract.—*Assay Methods.*—E. Hercod summarizes the assay methods suggested by Hamilton (1913), Dale and Laidlaw (1913), Roth (1914) and Spaeth (1918). No original work is reported.—Chem. & Drug., *92* (1920), 1221.

Lard.—*Adulteration with Tristearin.*—R. H. Kerr detects this adulteration by the following test: Five grammes of the suspected lard are treated with enough warm acetone, in a stoppered cylinder, to make the mixture measure 25 mils. The mixture is then kept at 30°, and set aside for 18 hours, after which the liquid is decanted from the mass of crystals which will have formed and have settled to the bottom of the cylinder. The crystals next are washed with two portions of 5 mils each of warm acetone, care being taken not to break the deposit of

crystals. The crystal mass is next treated with another 5 mils portion of acetone and transferred rapidly to a small filter, again washed with acetone and the latter as nearly as possible removed by means of suction. The crystals are then dried on filter paper and their melting point determined. If this be below 63°, adulteration is indicated. The fatty acids are then obtained from the crystals in any of the customary manners, and their melting point determined. If the melting point of the crystalline deposit (glycerides) plus twice the difference between the melting point of the glycerides and that of the fatty acids is less than 73°, the lard may be said to be adulterated.—J. Assoc. Off. Agric. Chem., 4 (1920), 195. (G. C. D.)

Milk.—*Acidity Pellets for.*—"Acidity pellets" were first introduced in England, and were intended to determine the acidity of milk. Each pellet contains 0.212 grain of dry sodium carbonate which has previously been moistened with a saturated alcoholic solution of phenolphthalein. The alkali is diluted with starch or milk-sugar and lightly compressed. In use, 10 mils of milk are introduced into a test-tube and the pellets dropped in, one by one, and crushed, until the milk turns a decided pink. The number of pellets required to develop the permanent pink shows the acidity of the milk in tenths per cent. of lactic acid in the sample examined.—Pract. Drug., 39 (Jan. 1920), 19.

Milk.—*Antiscorbutic Value of.*—Experiments conducted by Barnes and Hume show that fresh cows' milk has relatively much less activity than the fresh expressed juices of many fruits and vegetables. Dried milk is markedly deficient in antiscorbutic power when compared with fresh milk, yet its growth-promoting properties do not seem to be affected by the process of drying. Rapidly scalding milk, so as to keep it at 70 to 100° for 5½ minutes, which is commonly believed to kill tubercle bacilli, causes comparatively little damage to its antiscorbutic vitamine. The nature of the fodder fed to milch cows was found to have an important influence on the antiscorbutic activity of their milk. Summer milk from grass-fed cows has a higher value in this respect than winter milk. In winter-fed cows, mangolds as feed were found to yield milk distinctly inferior to turnips

or swedes. Since cows' milk is a food of inconstant value as regards its antiscorbutic properties, and as these are much reduced by drying, there is good reason for advocating the use of an extra antiscorbutic, such as raw orange or swede juice, in the dietary of infants fed on dried milk. With guinea-pigs, from 1.5 to 10 grammes of raw fruit or vegetable juice was found to have the antiscorbutic equivalent of 100 to 150 grammes of fresh cows' milk.—Biochem. J., through Pharm. J., 104 (1920), 171.

Milk.—*Condensed, Evaporated and Powdered.*—Fair quantities of powdered and condensed milk are manufactured in New Zealand, *e. g.,* in 1917-18, 2,950 long tons, and in 1918-19, 3,225 long tons, of dried milk were produced. Several new milk factories are being erected, and one plant is expected to turn out 5,000 lbs. of dried milk daily. There is only one large factory in New Zealand manufacturing sweetened and unsweetened condensed milk; in 1918 its output was 6,205,400 lbs. As New Zealand is an important dairy country, many more condensed milk factories will probably be erected to utilize the skimmed and surplus milk, and this industry will expand as soon as the price of machinery is reduced.—Comm. Rep., through J. Soc. Chem. Ind., 39 (1920), 111R.

Milk.—*Condensed and Dried.*—J. W. England outlines the preparation of canned condensed and dried milks and also gives an analysis of the composition of various kinds that are sold commercially.—Proc. Penna. Pharm. Assoc., 45 (1920), 245. (L. S.)

Milk.—*Cause of Curdling.*—Gehring notes that the curdling of milk is caused either by the action of the lactic acid bacilli, or by an enzyme, rennin. In the former case the milk sugar is broken up with the formation of lactic acid, which acts on the calcium present in the milk, producing calcium lactate and free casein. The calcium caseinate is also broken up by rennin, but in this case soluble milk casein and insoluble calcium paracaseinate are formed. In order to prevent the curdling of milk the utmost cleanliness should be exercised. The milk is secreted free from ferment-producing germs, and these enter the milk

only from the environments.—Molk. Ztg., through Drug. Circ., 64 (1920), 218.

Milk.—*Chemicals Influencing Coagulation.*—M. Doyan finds that ether and alcohol aid coagulation; while sodium nucleinate (1 to 200) hinders coagulation. The nucleinate added to freshly drawn blood hinders coagulation but hastens hemolysis.—J. pharm. chim., 22 (1921) 200.

Milk.—*Dehydration of.*—J. G. Wright describes the method used in Canada for drying milk, in which 160°F. is the highest temperature employed, producing a milk powder, devoid of "cooked" taste, from which butter and cheese have been made two years after drying by adding water and proceeding in the usual way. The fat globules are not broken up and the powder will keep indefinitely. The product is not germ proof, but the number of bacteria present is small compared with the number present in ordinary fluid milk.—Chem. News, 120 (1920), 173. (J H.)

Milk.—*Detecting Abnormal.*—I. J. Ott de Vries has applied the dye dibrom-o-cresol-sulphonphthalein recommended by Van Slyke and Baker for the identification of abnormal milk and has obtained very good results with it. Three mils of the milk are mixed with 1 drop of an aqueous saturated solution of the dye. In normal milk a grayish-blue color is produced; when less acid is present the color changes to dark blue, while with a higher percentage of acid a faint green or light yellow color is obtained. The latter may also be due to the addition of acid salts or formaldehyde to the milk or by pasteurizing the milk at too high a temperature. If the color produced is blue, the milk under examination is either from cows suffering from mammilis, or diluted, skimmed or alkaline salts have been added to it. In some cases the coloration is obtained without the milk being abnormal. Such samples should be subjected to a more careful analysis.—Nederl. Tijdschr. voor Melkhygiene, through Pharm. Weekblad, 57 (1920), 980. (H. E.)

A report from the New York Agricultural Experiment Station states that the foregoing test has been there applied to about

600 samples of market milk with satisfactory results.—Pharm. Era, 53 (1920), 242.

Pasteurized Milk.—*Detection of.*—M. Fouassier finds that raw milk always contains enough oxydases to give the blue color with tincture of guaiac and hydrogen dioxide, while pasteurized milk fails to give the reaction until an oxydase is added. The oxydase he prepares from a rose-colored or white potato, making a 10 per cent. aqueous maceration. After obtaining no color, with the suspected milk, the addition of the potato extract will bring forth the blue color. In running the test, while 10 minutes is sufficient to produce the color with the potato extract, the suspected milk sample should be allowed to stand with the tincture of guaiac and the hydrogen dioxide solution.—Am. chim. anal., through J. pharm. chim., 22 (1920), 33.

Milk.—*Digestibility of the Fats of.*—K. Stockert reports the results of experiments with fats of different milks, as to their digestibility, as follows:

Fresh milk	98.9% of the fat digested
Pasteurized milk	97.5% of the fat digested
Sterilized and homogenized	96.9%
Condensed unsweetened	95.7%
Dry milk	84.3%

The writer assumes that the lowering of the amount of digestible fat in milk after prolonged heating is due to the fact that in the coagulation of the albuminoids and the precipitation of the mineral substances some of the fat globules are rendered indigestible and that in the case of dry milk some of the fats are oxidized and have a higher melting point.—Pharm. Zent., 61 (1920), 372. (O. M.)

Milk.—*Effect of Formaldehyde on Analysis of.*—C. Porcher finds that the addition of one drop of 40 per cent. formaldehyde solution to 50 mils of milk did not affect the assay of the lactose, but when 5 drops were added the amount of lactose found increased from 5.00 to 5.31 per cent.—Ann. Falsif., through J. Soc. Chem. Ind., 39 (1920), 346.

Milk.—*Subcutaneous Injections of.*—On the assumption that intolerance towards the mother's milk might be due to anaphylaxis, two cases were treated by E. Weill by an anaphylactic vaccination by injecting hypodermically 5 and 10 mils of the mother's milk which had been sterilized for twenty minutes at 110°. In two cases, the vomiting, which had constantly occurred before treatment, stopped immediately after the administration of the injection. In a third case the severity of the vomiting was diminished, and stopped entirely after a second injection. In a fourth case, subcutaneous injection of the mother's milk rapidly stopped diarrhea with green stools; in forty-eight hours the stools became quite normal. One child who could previously take cow's milk showed an absolute intolerance of it after subcutaneous injection of its mother's milk. —Bull. Soc. Pediot., through Pharm. J., 104 (1920), 141.

Milk.—*Testing for Formaldehyde in.*—A. Gallego reports that when a few drops of fuchsin solution are added to milk containing formaldehyde, the red color of the fuchsin solution is changed to violet. The test detects 1 part of formaldehyde in 100,000 parts of milk.—Rev. Espanola. Med. Cir., through Am. J. Pharm., 92 (1920), 933.

Milk Drinks.—An anonymous writer states that milk drinks if made right are undoubtedly good, healthful, nourishing, and delicious, and when made according to the methods prepared by milk specialists of the U. S. Department of Agriculture, no difficulty should be experienced in marketing them. Methods are given for preparing buttermilk, yogurt or Bulgarian buttermilk, buttermilk lemonade and kefir or koumiss.—Am. J. Pharm., 92 (1920), 349. (J. K. T.)

Lac Fermentatum N. F..—Harrisson and Griffith report the results of some studies of Fermented Milk. It differs markedly from real koumiss which is made from mare's milk which contains 6 to 7 per cent. of lactose while cow's milk has 5 to 6 per cent. or less. Furthermore the N. F. product has added saccharose and fermentation is induced by baker's or brewer's yeast which has little effect on lactose. The yeasts used in the pro-

duction of koumiss belong to Torulaceæ and they ferment lactose with formation of ethyl alcohol. The authors have tabulated their findings, covering polarimetric readings, reducing sugars and alcohol percentage. In a specimen four weeks old they found 2.03 per cent. of alcohol and 2.47 per cent. of reducing sugars. The preparation's lack of palatability is probably due to the yeasty flavor. Half or less yeast would, in the author's opinion, be ample.—J. Am. Pharm. Assoc., 9 (1920), 514. (Z. M. C.)

Musk.—*Chinese Exportations of.*—In normal years exportation of musk from China averages in value upwards of $375,000. The European war and disturbed internal conditions in China have interfered with this trade. The musk is collected principally on the Tibetan-Chinese frontier. The city of Tachienlu is credited with handling about 300,000 taels annually, says Consul General Sammons, of Shanghai, China, in a report to the Chamber of Commerce.

The chief point for the collection of musk on the Tibetan-Chinese border is the city of Tachienlu, which draws its supply from a wide area, the musk being brought in by hunters and traders, and by Chinese merchants or their representatives in the interior. This commodity, which is obtained from the male musk deer, is received in its original form in what is known as a pod—a small, contracted skin pouch, seldom larger than a walnut. The pod sometimes contains as much as 2 ounces of musk, but usually the amount is less than an ounce. From Tachienlu and other interior towns where it is collected the musk is shipped in pod form to the cost during the cooler months of the year, as, due to the heat and moisture, it is likely to mold and spoil if shipped during the heated season.

The high value of musk offers a strong inducement for its extensive adulteration. In consequence of such adulteration, which is often most difficult to detect, it is considered a good average if, in a year's purchases, as much as 80 per cent. of pure musk is obtained.—Pharm. Era, 53 (1920), 74.

Mylabris Cichorii.—*A Worthy Candidate for Admission to the U. S.*—Owing to shortage of Spanish and Russian cantharides during the war Chinese cantharides which was readily available

came to be used. Study of it has led George E. Ewe to recommend its admission to the Pharmacopœia. "Its vesicating and rubifacient power is equal to that of the present U. S. P. varieties." The medical profession has used it with apparent success and without complaint of activity. The cantharidin content averages 50 per cent. greater than U. S. P. varieties. Pharmaceutically it is similar except in color. It is easily available and much cheaper than the official varieties.—J. Am. Pharm. Assoc., 9 (1920), 257. (Z. M. C.)

Mylabris Species.—*Cantharidin Content of.*—J. Cotte finds that *Mylabris variabilis* contains 1.93 per cent. of cantharidin; while *M. quadripunctata* contain 0.92 per cent.—J. pharm. chim., 21 (1920), 330.

Pituitary Gland.—*Active Principle of.*—Dudley extracts the dried and powdered infundibulum with acidulated water, clarifies the aqueous extract with ferric hydroxide and then extracts the filtrate at reduced pressure, with butyl alcohol. The butyl alcohol extract yields a crystalline residue which contains all of the uterine stimulant, along with some of the pressor principle and some contaminating substances. Dudley finds that contrary to the statement of Abel and Kubota, the uterine stimulant is not identical with histamine.—J. Pharmacol. Exp. Therap., through Am. J. Pharm., 92 (1920), 275.

Pituitary Glands.—*Iodine Absent from Sheep.*—E. G. Seaman, working with 30 grammes, 50 grammes and 100 grammes of sheep pituitary glands, has been unable to find iodine therein. —J. Biol. Chem., through J. pharm. chim., 22 (1920), 439.

Pituitary Glands.—*Pressor Compound in.*—A. C. Crawford reports that by treating extracts of the posterior lobe of the pituitary with mercuric chloride a substance is precipitated which possesses powerful pressor effect. The product appears to be pure, but no crystalline salts or derivatives have been obtained. The yield was very small.—J. Pharmacol. Exp. Therap., through J. Soc. Chem. Ind., 39 (1920), 425 A.

Placental Harmone.—*Sterile Extract of.*—J. A. Dean undertook the study of the placenta as a galactagogue and observed

that the feeding of the gland to non-pregnant females produced lactation. A properly prepared alcoholic extract produced the same result. The sterile extract should be prepared from tissue in which all conditions are normal. Membrane and blood vessels are removed and the gland properly cleansed. No insoluble powder such as talc or animal charcoal should be used in clarifying. Cultural tests should be made before being released and the solution dispensed in ampuls.—Proc. Penna. Phar. Assoc., 45 (1920), 214. (L. S.)

Spermaceti.—*Properties of and Constants for.*—In a 20-page article, Bohrisch and Kürschner discuss exhaustively the subject of spermaceti, including trade conditions, method of obtaining, nomenclature, physical and chemical constants and preparations. The authors report upon their examination of 21 authentic samples as well as presenting the figures obtained with adulterated specimens. They then discuss critically the constants given in the various pharmacopœias, comparing these figures with those obtained by them in studying their 21 analyzed samples.

Specific Gravity is very difficult to determine accurately. That of the 21 samples ranged from 0.916 to 0.942.

Melting Point also depends upon care in manipulation. That of the 21 samples ranged from 44 to 47.5°.

Acid Number of 19 samples ranged from 0.23 to 4.37.

Saponification Number varies between 118 and 135.

Iodine Number of 21 samples ranged from 2.43 to 7.94; most, however, were between the limits 3 and 5.

The paper closes with a pharmacopœial monograph on spermaceti suggested by the authors.—Pharm. Zent., 61 (1920), 703, 719 & 735.

Spider Venom.—Little is positively known about the specific nature of the venom of spiders, although there has been much speculation. The venom is an oily, translucent, lemon-yellow liquid having an acid reaction and a hot, bitter taste. It gives the xanthoproteic reaction and is rendered harmless by heating to 90°. In many ways the symptoms of spider bites resemble those produced by snake bites, so that it is probable that the

spider venoms belong to that class of poisons. It is known that snake venoms are very complex mixtures and that they differ greatly in the different species of reptiles. Among the ingredients that have been found are fibrin ferment and antiferment, proteolytic enzymes, cytotoxins for red corpuscles, and neurotoxins, as well as leukocytes and endothelial cells. The marked effects on the nervous system produced by the bite of black spiders, *Latrodectus mactans*, and other species of *Latrodectus* indicate that the venom of these animals resembles that of the cobra more nearly than the venoms of American snakes. Kobert believes that all parts of the spider contain a toxalbumin which in some species is mixed with the secretion of the poison gland. He considers that the secretion of the poison gland produces only local symptoms, while the general symptoms are due to the presence of this toxalbumin. It is because of the toxalbumin that the bite of *Latrodectus* is so severe as occasionally to cause death in human beings. It contains a hemolysin called arachnolysin which acts on the red cells of man, rabbit, mouse and goose, but not on the horse, dog, sheep and guineapig. Some authors question whether the nervous symptoms following spider bites may not be due to changes in the blood rather than to a direct toxic effect on the nervous tissues. —J. Am. Med. Assoc., through Am. Drug., 68 (Mch. 1920), 44.

Thyroid Glands.—*Constituents of Human.*—E. Zunz analyzed 32 human thyroids with the following results: *phosphorus,* 0.89 to 1.82 per cent., average 1.3 per cent.; *ash,* 2.6 to 5.11 per cent., average 3.86 per cent.; ratio of phosphorus to nitrogen, 0.062 to 0.140; ratio of iodine to nitrogen, 0.004 to 0.029; ratio of iodine to phosphorus, 0.025 to 0.422.—J. pharm. chim., 22 (1920), 361.

Chinese Wax.—*Constitution of.*—A. Gascard confirms Brodie's opinion that this wax consists chiefly of ceryl cerotate. He finds, however, that the cerotic acid has the formula, $C_{24}H_{57}O_2$ and the melting point, 82°; whereas the cerotic acid from beeswax is $C_{26}H_{52}O_2$ and melts at 77.5°.—Compt. rend., through J. pharm. chim., 22 (1920), 276.

East Indian Wax.—*Constituents of.*—Lipp and Casimir state that "ghedda" or East Indian wax contains approximately 48 per

cent. of ceryl alcohol, 7 per cent. of hydrocarbons (5 per cent. of heptacosane, 2 per cent. of hentriacontane, with traces of a hydrocarbon of low melting point), 24—25 per cent. of hydroxymargaric acid, melting point 55°—56° C., 1.5—2 per cent. of hydroxymargaric acid, melting point 71°—72° (hitherto unknown), 9—10 per cent. of margaric acid, 8—9 per cent. of palmitic acid, 2 per cent. of "ghedda" acid, and 1 per cent. of cerotic acid, with traces of formic, acetic, and butyric acids and tarry matter. Cerotic and ghedda acids are present mainly in the free condition, the others in the form of their ceryl esters. "Ghedda" acids, melting point 94.5°—95°, is given the provisional formula $C_{34}H_{66}O_2$. Its separation depends on its sparing solubility in ether and that of its potassium salt in alcohol.—J. prakt. chem., through J. Soc. Chem. Ind., 39 (1920), 163A.

INORGANIC CHEMISTRY

A—GENERAL SUBJECTS

ATOMS AND MOLECULES.

Atomic Theory.—*The New Viewpoint.*—Irving Langmuir's study of atomic structure (See YEAR BOOK, 1919, 291) is admirably presented in the following summary:

According to our present views all forms of matter are built up of atoms, but we no longer regard these atoms as indivisible, not even as simple structures. If a lump of ordinary matter the size of a baseball could be magnified to the size of the earth, the atoms in it would then have become above the size of baseballs. In other words, an atom is about as big compared to a baseball as the baseball is when compared to the earth. The atoms are constructed of particles of positive and negative electricity arranged in a very open structure. All the positive electricity is concentrated into a very small particle, called the nucleus, located in the center of the atom. The negative electricity exists in the form of electrons which arrange themselves in space about the nucleus. The size of the electrons and nucleus is small compared with that of the atom itself. Thus if we imagine an atom magnified until it has a diameter of one mile, the electrons would be about five feet in diameter, while the nucleus at the center would be only the size of a walnut.

The electrons in different kinds of atoms are alike, but there are as many different kinds of nuclei as there are chemical elements, that is about ninety-two in all. These differ from one another only in the amount of positive electricity they contain. Thus, for the simplest element, hydrogen, the nucleus has a unit positive charge which is able to neutralize the charge of a single electron. A hydrogen atom, then, consists merely of the nucleus and a single electron. The next element, helium, has a nucleus with a double positive charge, and the atom thus contains two electrons. In a similar way we find that the atoms of carbon have 6 electrons, while oxygen has 8, aluminum 13, sulphur 16, iron 26, copper 29, silver 47, gold 79, lead 82 and radium 88 electrons.

These electrons do not revolve around the nucleus the way the earth revolves around the sun, but they are arranged in three dimensions in a series of layers or concentric shells surrounding the nucleus. The electrons are probably not stationary, but each revolves in its own orbit about a certain equilibrium position. However, as we do not yet know much about these orbits, we can speak of the positions of the electrons in the atoms as though the electrons were located in these equilibrium positions.

The first two electrons in any atom form the first shell about the nucleus, that is, two electrons are much closer to the nucleus than any of the others. In atoms with more electrons the next eight electrons form the second layer; then comes another layer of eight. If there are still more electrons these arrange themselves in a layer of eighteen, followed by a second layer of eighteen, and finally there may be an outside layer of thirty-two electrons. It is the successive formation of these various layers which causes the similar recurring properties among the chemical elements which underlie the periodic table of the elements that is of such fundamental importance in chemistry.

The eight electrons in the second and third layers are arranged in a symmetrical way like the arrangement of the eight corners of a cube. This stable group of eight electrons is called the octet. The chemical properties of the elements result from the tendency of the individual atoms to take up or give up electrons in order to form these octets. That is, the atoms strive to take certain stable configuration characterized by geometrical symmetry. They accomplish this in some cases by exchanging electrons with each other, while in

other cases the atoms share pairs of electrons with each other—a sort of co-operative plan. The pairs of electrons thus constitute the chemical bonds between atoms which play such a prominent part in chemistry.

This theory of atomic structure and chemical combination not only explains an enormous number of chemical laws, which have been obtained by experiment, but it leads to important extensions and in some cases to modifications of these laws; while in other cases it has led to new relationships, and has made it possible to predict correctly the properties of certain substances before these properties have been determined by experiment.—Am. Drug., 68 (Oct., 1920) 25.

Atomic Weights.—*Relation to the Harmonic Triangle.*—Taking the mathematical expression of the relation of triangle to its surrounding circle

$$R = \frac{\sqrt{5}}{2} = 1.118 \text{ etc.}$$

E. Schmiz submits the hypothesis that the ratio between the atomic weights of the elements in the same periodic group may be expressed by the ratios deduced from the harmonic triangle.—Ber. Dtsch. Pharm. Ges., 30 (1920) 27; Pharm. Ztg., 65 (1920) 945.

The Schmiz hypothesis is criticized by Droste.—Pharm. Ztg., 65 (1920) 822.

Atoms.—*Structure of.*—A. Berthoud presents a very comprehensive account of the theories relating to the structure of atoms in which the author concludes that if even it is still impossible to represent each atom by a model showing all details of structure, a way has been opened to do so, which will sooner or later lead to the possibility of ascribing all forms of matter to simple differences in the arrangements and the movements of the ultimate particles of two primordial elements, positive and negative electricity.—Chem. News, 120 (1920) 171 and 184. (J. H.)

Chemistry.—*Recent Developments in.*—T. Sabalitschka discusses interestingly the newer theories of chemistry and physics, including Einstein's views of relatively, the infinitely small size of

atoms, Moseley's law, Bohr's views of atom structure, Zederbauer's book on the Harmony of Nature and Art, Rutherford's disintegration of the nitrogen atom, Morgenroth's study on stereoisomerism and medical action, Padva's work on the influence of chemical affinity upon the speed of crystallization, Vorländer and von Weinberg's views on the structure of the benzene molecule, Fischer's work on glucosidal syntheses, on tannins and on proteins, and Willstätter's work on chlorophyll. For details, the reader is referred to original paper.—Pharm. Ztg., 65 (1920) 553, 573 and 593.

Electrons and Chemical Potential.—F. G. Edwards reviews Dr. Victor Henri's book, "Etudes de Photochimie." While Edwards picks out flaws in the book, e. g., "Dr. Henri * * * is hampered by orthodox but imperfectly developed theories, which have proven themselves effective in the immediate past"; his appraisement of the value of the book is shown by the following paragraph:

"When Dr. Henri's work on the organic compounds is completed, the position and motion of *every* electron will be indicated by his absorption graphs, and the mechanism of absorption is reciprocal with that of emission of light; or the transformation of the energy of absorbed ultra-violet rays into infra-red frequencies, emitting electrons, constitutes the photo electric effect, while the reverse action constitutes phosphorescence."—Chem. News, 120 (1920) 292.

Elements.—*Arrangement of Atoms in Crystals of.*—By use of Bragg's X-Ray method, A. W. Hull has studied the arrangement of atoms in crystalline forms of calcium, titanium, zinc, cadmium, indium, ruthenium, palladium, tantalum and iridium.—Science, 52 (1920), 227.

Elements.—*Constitution of.*—F. W. Ashton has been making use of a new method of positive-ray analysis in a research into the constitution of the elements. At the end of last year he announced that he had found that atmospheric neon (atomic weight 20.2) is a mixture of two isotopes of atomic weights 20 and 22. Carbon and oxygen by the same method are found to be "pure." Chlorine is found to consist of at least two isotopes of atomic weights 35 and 37, which is supported by the fact that hydrochloric acid and phosgene each show two compounds. Mercury is shown to be a mixture

of at least three or four isotopes grouped in the region corresponding to 200. Early this year Mr. Ashton made another communication to *Nature,* from which we quote these particulars, in which he stated that argon contains isotopes and krypton has no fewer than six constituents. Nitrogen is apparently a "pure" element. The latest results announced in *Nature* are that boron consists of two isotopes, fluorine is simple, silicon has probably three isotopes in its composition, bromine, (atomic weight 79.92) is composed approximately equal parts of isotopes 79 and 81, phosphorus and arsenic are apparently simple elements. In the case of sulphur the data are as yet insufficient to give a decision as to the presence of small quantities of isotopes. This interesting research will enable a new classification to be made of the elements, and will account probably for some of the difficulties which have been experienced in reaching finality in atomic weights.—Chem. & Drug., 93 (1920), 1112.

Elements.—*Constitution and Structure of.*—Hawksworth Collins presents testimony as to the mathematical relationship existing between the various elements. One paper particularly concerns the manganese atom.—Chem. News, 120 (1920), 265 and 121 (1920), 157, 182 and 219. (J. H.)

Elements.—*Interrelationship of.*—H. Collins thinks that this subject is a much larger generalization that the periodic observation; that it is much fuller in detail than the latter and leads to the constitution and structure of nearly all the elements. Three tables are given. Table 1 gives all pairs of elements, the sum of whose atomic weights approximate to the atomic weight of vanadium. Tables 2 and 3 give corresponding information regarding chromium and manganese. Experimental data are first given. Then three sets of coincidences are noted, each set being proved to be due to some cause and not to chance, and finally the truths, which have caused the coincidences to be observed, are discussed. Claim is made that some unknown source of error exists, which causes the atomic weights in general to be estimated as greater than they really are; just as there are formerly (when H was taken as the unit) some error admitted by chemists, which caused the atomic weights to be estimated as less than real value.—Chem. News, 120 (1920), 169. (J. H.)

Helium.—*Structure of Atoms of.*—Irving Langmuir discusses Bohr's conception of the structure of the helium atom handling the problem from the mathematical standpoint.—Science 51 (1920), 605.

Isotopes.—*Whole Number.*—F. H. Loring gives a resumè of the literature showing evidence that whole number isotopes are a reality and the isotopic proportions may modify the electrical properties of elements. Among the topics discussed as 1, The Experimental Demonstration of Isotopes; 2, Spectroscopic Examination of Isotopes; 3, Photo-Electric Effect and Isotopes; 4, Cyclic Evolution of the Elements and Isotopes; 5, Evaluation of Hypothetical Isotopes; 6, Isotopes and Electrical Conductivity. Numerous references and several comparative tables are given.—Chem. News, 120 (1920), 73. (J. H.)

Other papers on the speculative side of chemistry published during the year by Mr. Loring are: "Structure of Matter and the Quantum Theory," "Structure of Matter and Isotopes" and "Relativity."—Chem. News, 120 (1920), 181, 193 and 205 and 121 (1920), 2, 105 and 277.

Isotopism.—After reviewing the atomic theory beginning with Dalton and leading up to Soddy's isotopes, J. F. Corrigan suggests that the true atomic weights of all elements are whole numbers as suggested by Prout and that where careful and repeated determinations have shown other than "whole number" atomic weights that these deviations are due to mixtures of isotopes of the elements. Noting that many elements derived from widely different sources, and during intervals of many years, exhibit identical atomic weights, he asks "what underlying and unseen natural law has operated to cause the effect of the complete identity of the isotopic proportions of any one element?"—Chem. News, 121 (1920), 88 and 102. (J. H.)

Isotopy.—In an address delivered to the Instructional Corps of the Philadelphia College of Pharmacy and Sciences, Dr. Henry Leffmann gave an interesting summary of the work on the isotopes of lead and their potential influence upon the atomic theory.—Am. J. Pharm., 92 (1920), 848.

Littlest Things in Chemistry.—W. R. Whitney gave this title to the 1920 Chandler Lecture delivered by him at Columbia University. In it he discussed the modern conception of the atom and its far-reaching influence not only upon scientific thought, but also upon chemical and physical influence. The paper should be read by everyone interested in chemistry.—J. Ind. Eng. Chem., 12 (1920), 599.

Matter.—*Ancient Theories of.*—Leo Suppan presents a most interesting discussion under the above title. He is not disposed to blame the ancient Greeks severely for having drawn their theories from their inner consciousness instead of deriving them inductively from data obtained by experiment as do historians generally. He points out that our corpuscular theory of matter shows rather close relationship to the teachings of Leucippus and Democritus. The philosophers of the pre-Socratic period are classified, their theories and teachings analyzed in a manner easy of comprehension. The groups include the Hylozoists represented by Thales, Anaximenes and Anaximander; Heraclitus and his "fire"; the Stoics and the "fire" theory.—Nat. Drug., 50 (1920), 473. (C. M. S.)

In a second paper, Suppan discusses: (a) Empedocles and his theory that the four elements, earth, water, fire and air were the "roots" or "germs" of all things and that intimately associated with them were two forces "love" and "hate"; (b) Anaxagoras with his qualitative atomism and *nous* which principle acted on mass and caused like particles to unite with each other; (c) the Atomism of Democritus.—Nat. Drug., 50 (1920), 500. (C. M. S.)

Periodic System.—*Expressed as a Spiral.*—C. R. Nodder presents in a drawing a double spiral expressing his conception of the periodic system. In a later paper, J. R. Partington discusses the Nodder double spiral and presents a diagram showing the periodic table in the form of a single spiral.—Chem. News, 121 (1920), 269 and 304.

Ultimate Matter.—J. F. Corrigan traces historically the search for "ultimate matter" beginning with the thoughts of the Hindu, Greek, Egyptian and Arabian philosophers and alchemists, he then takes up Prout's hypothesis, Dobereiner's triads, Newlands octaves, the periodic law and closes with a discussion of the "Unitary The-

ory of Matter" obtained from the study of radio-active phenomena. After briefly discussing Crook's theory of "extinct," "rare" and "common" elements, the author speculates as to whether the degradation process is confined to only a few elements or whether it might not be possible that all elements are slowly resolving themselves into simpler forms. If it is possible to imagine that all elements have been built up from the protyle then it is also possible to imagine them all breaking down again into the same substance.—Chem. News, 120 (1920), 242 & 258. (J. H.)

PHYSICAL CHEMISTRY.

Bioluminescence.—All luminous animals require oxygen for the production of light, but there has been some doubt as to whether carbon dioxide is given off as a result of the phenomenon. A brilliant luminescence results when a solution of luciferase is added to a solution of Cypridina luciferin. Experiments by E. N. Harvey show that the reaction cannot be compared with the reactions in cells accompanied by a liberation of carbon dioxide. It is probably similar to the oxidation of a leuco dye. The heat change during the oxidation of luciferin by luciferase also is very small. It is estimated that 1 gramme of luciferin develops less than 0.1 calory during the oxidation process accompanying luminescence. This clearly distinguishes this oxidation from that of the oxidation of dextrose, 1 gramme of which will give 1000 cal. This fact also renders it probable that no carbon dioxide is formed during the process.—J. Gen. Physiol., through Pharm. J., 104 (1920), 332.

Catalysis.—J. W. Teesdale notes that as early as 1794 it was observed that certain substances influenced chemical reaction without undergoing apparent change. In 1835 Berzelius termed this property "catalysis" and at a later date Ostwald defined catalysts as bodies which change the velocity of a chemical reaction without modifying the energy factors of the reaction. Catalysts are classed as negative and positive. The former class retards chemical action while the latter accelerates it. Mention is made of the employment of catalytic agents in Welsbach mantles and also in the manufacture of sulphuric and nitric acids, chlorine, ammonia, formaldehyde, hydrogenated fats, isoprene and alcohol. The enzymes act as catalysts and it has been suggested that these consist of an organic col-

loid associated with an inorganic colloid, the latter termed the "co-enzyme" and being the more active as a catalyst. Presence of calcium in coagulating enzymes, iodine in thyroid and other examples are cited.—Pharm. J., 104 (1920), 299. (C. W. B.)

Cold Flames.—It is pointed out that when ether is mixed with a small amount of carbon tetrachloride, it will burn, but with a flame of such low temperature that it will neither ignite nor blacken paper. The same effect is obtained by igniting a mixture of ether vapor containing a small amount of carbon dioxide.—Drug. Ztg., through Pharm. Zent., 61 (1920), 133.

Color of Mixtures.—*Subdivision a Factor.*—J. W. Sturmer states that it was not always the quantity of a coloring substance but its state of subdivision that is responsible for the color of the preparation. The same subdivision of the coloring principle is necessary each time the mixture is prepared or the color will be different. Particular reference is made to the necessity of marking any unusual procedure in compounding colored mixtures on prescriptions so that when refilled they will have the same color as when originally compounded.—Proc. Penna. Assoc., 45 (1920), 156. (L. S.)

Crystals.—*X-ray Examination of.*—At a meeting of Royal Institute, W. L. Bragg showed, by means of ingeniously constructed models, together with lantern slide representations of these, and tables, what exact knowledge was now available not only as to the atomic volume of the elements, but also as to molecular volume and the configuration in space of atoms and molecules. Hitherto, even when the atomic volume was approximately ascertainable, it was still impossible, save on loosely speculative lines, to estimate molecular volumes, since there was no means of finding out what spaces intervened between atom and atom in a molecule. But the X-ray method enabled the operator to analyze with mathematical precision both the arrangement in space of atoms in a molecule, and the distances, infinitesimal as these are, between the atoms in it, and furthermore, to give a physical interpretation of many hitherto obscure phenomena of crystalline structure. Taking two types of crystal, the cube exemplified by such compounds as sodium and potassium chloride, and the rhombohedron, of which barium carbonate is an

example, it is found that in the former case, as the constituent elements are of opposite signs, the stability of the combination is due to electrostatic attraction, which is prepotent over the interatomic repellent force. In the second case, in which the elements are of the same sign, stability is secured by electron-sharing—that is, each positive nucleus, instead of retaining its own neon shell intact, shares it with the other partner or partners in the collocation—the result being a common shell for the compound molecule. This redistribution is accompanied by a reduction of volume since, if we figure atoms and molecules as spheres in the case under consideration, either the number of spheres is reduced or their volume is diminished. X-ray analysis explains many of the physical properties of crystals, such as the hardness of the diamond and the ductility of certain metals. In the diamond, the carbon atoms being all of the same sign are electron-sharing, and so strongly held together that it is only by breaking up the crystal that the molecular grouping can be disintegrated. In the ductile metals the electrons are transportable, so that a new configuration of the molecule can be effected without disintegration of crystalline structure.—Pharm. J., 104 (1920).

Einstein's Theory.—In a review of Einstein's book "Relativity: The Special and the General Theory: A Popular Exposition," this famous theory is explained as follows: The exposition opens with a critical examination of the Euclidean geometry, and the result is summarized in the statement that "every description of events in space involves the use of a rigid body to which such events have to be referred. The resulting relationship takes for granted that the laws of Euclidean geometry hold for 'distances,' the 'distance' being represented physically by means of the connection of two marks on a rigid body." Taking the illustration of a railway train travelling uniformly past an embankment, Einstein proceeds to show that in the case of the movement of a passenger in the train who walks along the carriage in the direction in which the train is going, and of two flashes of lightning which it is alleged simultaneously strike the line in two places, A and B, far distant from each other, the classical mechanics is in error. In the first case, contrary to the orthodox conception, the rate of progression of the passenger's walk is to be deducted from, and not added to, the velocity of the train relative to the embankment; and in the second case the true statement is that the observer in the train, who is being carried to-

wards B, will see the beam of light emitted from that place sooner than that from A, from which he is receding. That is to say, the simultaneity is not positive but relative to the observer. Hence an event has one value for the observer who is at rest and another if he is in motion. This and other apparent anomalies are resolved by Lorentz transformation, to formula for which our readers must turn to Einstein's book. Many data of physical science for which at present there is no place under any recognized general law require for their interpretation the hypothesis of a "four-dimensional space-time continuum." This is not a metaphysical but a strictly mathematical doctrine, in which the three-space co-ordinates of the Euclidean geometry receive a complementary fourth co-ordinate. We can figure a two-dimensional space-time continuum, and a four-dimensional space is not unthinkable. The case of the behavior of clocks and measuring rods on a rotating body of reference demonstrates that the propositions of Euclidean geometry cannot hold exactly on a rotating disc, nor in general in a gravitational field. So that the idea of a straight line as the shortest distance between the two points loses its significance. Indeed, the so-called straight line may be merely an infinitesimal section of an indefinitely extended curved line. In Einstein's own words: "In gravitational fields there are no such things as rigid bodies with Euclidean properties"; thus, the fictitious body of reference is of no avail in the general theory of relativity. Theoretical considerations would lead us to expect that "however far we might travel through space, we should find everywhere an attenuated swarm of fixed stars of approximately the same kind and density." But this view is not in accordance with the theory of Newton, which seems to indicate that the universe should have a kind of center in which the density of the stars is a maximum. "The stellar universe ought to be a finite island in the infinite ocean of space." The review closes with an explanation of the three recent proofs of the validity of the Einstein theory: Seeliger's modification of Newton's law as to attraction; Riemann's three-dimensional spherical space; and the photographic registration of the stars at the solar eclipse in May, 1919.—Pharm. J., 105 (1920), 264.

Ionic Dissociation and Hydrogen-Ion Concentration.—F. P. Stroup quotes Aristotle as observing that "Nothing can be positively known and even this cannot be positively asserted." So far as this applies to chemistry the old philospher was right.

Stroup says that if we could see the ultimate particles that make up what we call matter and could study their movements, we could be more certain in our conceptions. The more facts that are capable of explanation by one and the same theory the greater are the chances of its being the true theory. The ionic theory consistently explains so many things that chemists generally accept it as being *the* true one. The author then gives a comprehensive description of "electrolytes," which are frequently termed "Ionogens." Most chemical action, possibly all chemical action, he says, is between ions and not molecules. The determination by electrical conductivity of the dissociation of compounds when dissolved in a dissociating solvent is very clearly explained and the many advantages accruing from its utilization set forth. Conductivity methods are now used in many laboratories connected with large industries in place of volumetric methods for determinations other than those involving neutralization.—Am. J. Pharm., 92 (1920), 81. (J. K. T.)

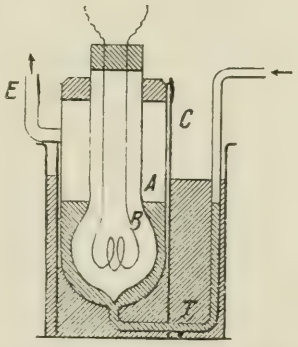
Light.—*Action on Various Chemicals.*—J. B. M. Coebergh gives an interesting study of the action of light on chemicals; acting upon these with sunlight, uviol light, the light emitted by the mercury-quartz lamp, the Nernst lamp and the electric arc. Furthermore lights of varying wave length, obtained by allowing the light to pass through especially constructed filters was employed. It was found that ethyl bromide, ferric and ammonium chloride, ferric chloride solution, sodium and iron pyrophosphate solution, white precipitate, chloroform containing alcohol, potassium iodide and sodium iodide are not affected by light.

Hydrobromic acid, nitric acid, monobromated camphor, quinine and its salts, pyramidon, iodoform, physostigmine salicylate and mercury tannate are affected by light or short wave lengths, 408_{MM} and should be kept in red, brown or green glass containers. Ether, calomel and santonin are affected by light of 450_{MM} wave length and should be preserved in red, dark brown or green containers. Light with a wave length of 500_{MM} affects chlorine water, this should be kept in red or dark brown bottle. Benzoic acid, silver proteinate, mercuric iodide, hydroquinone, beta-naphthol and pyrogallic acid are acted on by light of 600_{MM} wave length and iron pyrophosphate with ammonium citrate by such of 550_{MM} wave length. These should be kept in red glass containers. Light with 700_{MM} wave length acts on

apomorphine hydrochloride, mercurous iodide and phenol, of 600_{MM} wave length on bromoform, and sweet spirit of nitre, of $500\text{-}600_{MM}$ on hydrogen dioxide solution and light with a wave length above 600_{MM} destroys hydrocyanic acid and tincture of iodine. Mercuric oxide, phosphorus, liquefied phenol and adrenalin solution are acted upon by light of any wave length. For such products red or dark green glass containers should be used.

In order to find whether or not brown glass is of the proper quality it should be filled with a one per cent. solution of benzidine in chloroform and the bottle should be exposed to sunlight for 5½ hours. No turbidity should be produced in the liquid. Dark brown or dark green bottles are tested by means of celloidin paper, on which violet or ultraviolet light is allowed to act. No blackening of the paper should be produced when exposing the bottle to direct sunlight for 80 minutes. Red glass may also be tested with this paper, no discoloration should take place when the bottle is exposed to direct sun-light for 15 minutes.—Pharm. Weekbl., 57 (1920), 1452. (H. E.)

Photochemical Reactions.—*Apparatus for.*—Volmar and Dufraisse have devised a simple apparatus for photo chemical synthesis; for example, chlorination reactions. It consists (Fig. 20) of a silvered cylinder 25 cm. long and 8 to 10 cm. in diameter (A), provided with a narrow entrance tube at the bottom (J) and a broader exit tube at the top (E). The cylinder is made air-tight by a stopper through which passes an incandescent bulb (B). By means of this apparatus, Volmar was able to prepare with almost quantitative yield, monochlor-methyl sulphate, SO_4 (CH_3) CH_2CL.—J. pharm. chim., 22 (1920), 253 & 254.



Phototropic Phenomena.—This term is used by J. R. Mourelo to designate color changes produced in certain chemicals by action of light. It differs from ordinary color changes by light in the fact that when the illumination is discontinued the chemical goes back to its original color.

In the paper, Mourelo discusses in detail the phototropic changes noted in the sulphides of calcium and strontium, in anthracene, in Stobbe's fulgides and in crystalline nickel sulphate.—Chem. News, 120 (1920), 289.

Piezo Electricity.—By shaking an ounce of Rochelle salt crystals, A. M. Nicholson is able to generate a current of electricity of sufficient volume to carry sound through the telephone. This he calls piezo electricity, the word "piezo" signifying pressure. At a demonstration made in New York, Mr. Nicholson was able to supply a current of sufficient velocity to carry the sound of a phonograph through many circuits to 160 telephone receivers distributed among the audience. "A crystal of the chemical may be mounted in a suitable holder into which a phonograph needle is inserted," stated Mr. Nicholson. "If it be held in the hand over a moving phonograph record, the vibrations from music or speech that are imparted to it through the needle will generate sufficient electricity to operate a large number of receivers connected in series. Thus about twenty-five people may 'listen in' to the changes which are in progress in a single crystal. If instead of a phonograph record ordinary speech be applied to a crystal, which is placed within a suitable box, the sound may be imparted to a larger number of receivers. A crystal may be operated as a receiver, and speech may be heard several feet away if a microphone transmitter is employed at the sending end to magnify the sound. If passed through an amplifier, then correspondingly loud effects are to be produced by the crystal receiver."

Experimental work is being carried on with many other mineral substances, although so far the Rochelle salt battery has given the best results.—Am. Drug., 68 (Jan. 1920), 22.

COLLOIDS

Cellulose and Starch.—*Adsorption by.*—It is a well-known fact that in analytical work discrepancies can occur on account of some salts being readily absorbed by filter paper, due to the colloidal nature of the paper which is negative colloidal to water. K. Scheringa reports on a number of experiments carried out with various chemicals. He found that sodium chloride is not absorbed by filter paper, but that paper absorbs more sodium hydroxide from concentrated solutions than from weak solutions. White quinine hydro-

chloride is not absorbed, codeine is taken up by filter paper. Copper sulphate is not absorbed from concentrated solutions but slightly chloride from diluted solutions. Copper sulphate is also absorbed from diluted solutions but liberated by the addition of hydrochloric acid.—Pharm. Weekbl., 57 (1920), 1289. (H. E.)

Colloidal Electrolytes.—*Soap Solutions as.*—McBain and Salmon submit a comprehensive theory of soap solutions, leading to a definition of colloidal electrolytes—a class the members of which will probably prove more numerous than acids and bases put together. They are salts in which one of the ions has been replaced by an ionic micelle.

The ionic micelle in the case of soap exhibits an equivalent conductivity equal to that of potassium ion, and double that of the palmitate ion which it has replaced. Its formula may correspond to $(P')_{n\,.\,m}(H_2O)$, but more probably it is $(NaP)_x(P')_n\,.\,(H_2O)_m$, where P′ is the anion of the fatty acid in question.

In concentrated solutions soaps exist chiefly in colloidal form, together with sodium or potassium ion, equivalent to the ionic micelle present, whereas in dilute solution both undissociated and dissociated soap are crystalloids of simple molecular weight.

In mixtures of soaps the tendency is to form more micellæ. Addition of electrolytes, however, exert opposing influences, dehydrating and driving back dissociation.

The conception of the ionic micelle serves to explain the behavior of solutions of dyestuffs, indicators, and proteins.

A modification of the dew-point method is described, which has enabled measurements of osmotic activity and "molecular weight" to be carried out, free from the uncertainties of interpretation of the results obtained for colloids by the osmometer method, and superseding the well known but erroneous data of Krafft.—Chem. News, 120 (1920), 105.

Colloidal Silicic Acid.—*Action of Electrolytes on.*—L. F. Werner, working on the retarding and accelerating effects of ionogens upon the setting of colloidal silicic acid, points out the necessity of starting with a pure silicic acid of uniform concentration and of like hydration. Werner prepared his colloid as follows: 50 mils of commercial sodium silicate solution (40° Baumé) are diluted with 150 mils of distilled water, and this solution is added with constant

stirring to 50 mils pure concentrated hydrochloric acid. Dialysis is carried out in a tall cylindrical glass of 3 liter capacity after the mixture had been placed in a "Parlodion" bag, for a period of 29.5 hours, the distilled water being changed after 3, 3½, 15 and 6 hours. The product is slightly translucent and gives but a slight opalescence with silver nitrate solution. In experiments, 4 mils of this colloid solution are added to the required amount of ionogen solution, diluted with sufficient distilled water to make 4 mils of the mixture; the solutions are thoroughly mixed; the end-point is taken when no flow was noted upon inverting the tube containing the mixture. Werner found that both acids and alkalies have strong peptyzing effects upon colloidal silicic acid; strong acids were strongest at medium concentrations, strong alkalies at medium to low concentrations. Salts in the presence of weak and strong acids caused no effect; in the presence of weak and strong alkalies they caused a quick setting of the colloid. The potassium salts of negative radicals decreased the time required for the gelation of colloidal silicic acid; this also holds true for the chlorides of various metals, except ferric and cupric chlorides. In the presence of the two acid sodium phosphates colloidal silicic acid jells very rapidly; tri-sodium phosphate at strong and medium concentration has a strong peptyzing effect. Werner tabulates his results after each experiment noting the concentration of the ionogen in the final mixture and the time in days, hours and minutes taken for the setting or the peptyzing effect of the silicic acid colloid.—J. Am. Pharm. Assoc., 9 (1920), 501. (M. O'C. D.)

Colloids.—*Their Use in Medicine.*—R. Cecil Owen writes a very interesting article on colloids. While the subject is comparatively new, Graham demonstrated their existence about sixty years ago. He showed that solutions were of two classes according as they passed or did not pass through parchment membrane; those not passing he called colloids from the Greek *kolla*, glue.

It was found by determining osmotic pressure, freezing points and vapor pressure, that the molecular weights of all colloids were enormous. It is, therefore, evident that in colloidal solutions the molecules are of huge size and are formed by the coalescence of "ordinary" molecules into which they may theoretically at any rate, be resolved. Colloids and ions bear an important relationship to

each other of which Owen gives examples to prove his statements. The different methods of preparing colloids are as follows: Building up or breaking down of molecules; dissolving the substance in alcohol and precipitating with a large volume of water; also by the use of electrodes.

To ascertain whether a given liquid is colloidal or not it is necessary to determine whether it has the property of scattering light with the aid of an ultra microscope and also if they are capable of polarizing light. Another method is to determine the "gold number," that is, the weight in multigrains of the given colloids which just fail to prevent the change from red to violet in 10 mils of gold sol. (.0053 to .0058 per cent of gold) when 1 mil of 10 per cent of sodium chloride is added to the sol. The lower the gold number the greater the protective effect of the colloid. Then there is the simple method of determining how long a colloid remains as such. Poorly made colloids are precipitated by blood serum and by other physiological fluids.

A large number of colloids are used in medicine, the article giving their uses.—Pharm. J., 105 (1920), 497. (J. M. W.)

Osmotic Pressure.—*Influence of Ions on.*—J. Loeb recommends the use of gelatin solutions and collodion membranes for the direct measurement of osmotic pressure and records experiments and conclusions based thereon as to how and why ions influence the osmotic pressure of solutions.—Chem. News., 121 (1920), 64. (J. H.)

ANALYTICAL CHEMISTRY.

Acidimetric Analyses.—*Sodium Carbonate and Oxalic Acid for.* Normal sodium carbonate can be prepared from sodium bicarbonate by heating the latter in a platinum crucible at 250° and stirring with a platinum rod in such a way that all of the salt is brought into contact with the air. Microcrystalline oxalic acid can be weighed out directly for analysis but care should be taken to protect weak solutions (N/10 and N/100) from light, preferably in green bottles, since it was found that blue, brown or amber glass frequently affords no more protection than flint glass. Stronger solutions of oxalic acid keep comparatively well according to Kunz-Krause and Richter.—Arch. Pharm., through Drug. Circ., 64 (1920), 163.

Acids.—*Iodometric Estimation of.*—Acids can be estimated iodometrically according to the equation:

$IO'_3 + 5I' + 6H' \rightarrow 3H_2O + 3I_2$ and numerous methods have been recommended for this purpose. I. M. Kolthoff found that excellent results are obtained when applying the method to strong acids, and that very good results are obtained with weak acids also. The time required for the completion of the reaction varies with the different acids, but in no case should the titration be carried out earlier than ten minutes after the mixing of the reagents. An excess of potassium iodide should always be present, as otherwise ICl is formed, which oxidizes the sodium sulphate and the results consequently are erroneous. Organic oxyacids can be titrated with good results when the negative ion is removed as an insoluble salt or as a complete anion by the addition of barium chloride, calcium chloride, magnesium chloride or zinc sulphate. The results with weak organic acids which do not contain an oxy group, are not satisfactory; formic acid, however, being an exception. The method, however, can very probably be used for the estimation of acids in fruit juices, etc. For the details of the estimation of tartaric acid, citric acid, malic acid, succinic acid, acetic acid, etc., the original should be consulted.—Pharm. Weekbl., 57 (1920), 53. (H. E.)

Copper.—*Gravimetric Assay.*—Votocek found that copper is completely precipitated from its solutions by sodium nitroprusside, while mercury is not affected by this reagent. A solution of both metals is mixed with an excess of sodium chloride solution, the mixture acidulated with sulphuric acid and the copper is precipitated by sodium nitroprusside solution. The precipitate is collected on a filter, washed well with water and dried to constant weight. From the amount of precipitate the amount of copper is calculated. In the filtrate, the mercury is determined either as sulphide or volumetrically.—Chem. Ztg., through Pharm. Weekbl., 57 (1920), 744. (H. E.)

Ice Cream.—*Chemical and Bacteriological Examination of.*—Joseph L. Mayer presents a simple method for the chemical and bacteriological examination of ice cream. In making a quantitative determination of fat in vanilla ice cream, Dr. Mayer uses the following method: Accurately weigh 9 grammes of the melted and thoroughly mixed sample into a Babcock milk bottle, add 10 mils

of glacial acetic acid, follow with 10 mils of sulphuric acid, sp. gr. 1.84, mix thoroughly by rotary motion and allow to stand five minutes. Place in centrifuge, whirl for eight minutes, now add hot water up to the neck of the bottle, and whirl for five minutes. Remove bottle from machine, place in hot water for ten minutes, return to machine, whirl three minutes, read the percentage of fat on the neck of the bottle with a calipers, multiply this reading by two, the result is the percentage of fat. For chocolate, strawberry and other kinds of ice cream, Dr. Mayer uses the Roese-Gottlieb method for determining fat in condensed and evaporated milk. Dr. Mayer uses a tube for the extraction of the fat in these experiments which is much shorter and wider than the usual ones employed in this method; this tube was made from Dr. Mayer's specifications. For the bacteriological examination Dr. Mayer makes his agar medium according to the "Standard Methods of Bacteriological Analysis of Milk," and proceeds as follows: Ice cream samples are collected in 4 ounce wide mouth glass stoppered and sterilized bottles and are allowed to melt; one mil of a sample is placed in 99 mils of sterile water, shaken thoroughly and one mil of this dilution is added to another 99 mils of sterile water making a dilution of 1 to 10,000. This dilution is shaken thoroughly and one-tenth mil of it is placed in one Petri dish and 1 mil in another Petri dish. To each dish is added 10 mils of liquefied agar of about 45° C., and after mixing by rotation and hardening by standing, the mixtures are placed in an incubator at 37° C. for forty-eight hours, then count the colonies with a two and one-half diameter lens; multiply the number of colonies in the dish containing one mil by 10,000 and the number of colonies in the dish containing one-tenth mil by 100,000 to obtain of bacteria per mil of ice cream. —J. Am. Pharm. Assoc., 9 (1920), 777. (M. O'C. D.)

Electrometric Titrations.—I. M. Kolthoff discusses this subject from the mathematical standpoint dealing by analytical geometry with the neutralization curves of acids and bases determined by conductometric methods. The paper is in three parts: (a) The neutralization of acids and bases; (b) the titration of two acids or of two bases together; (c) the titration of weak acids or bases as constituents of salts.—Z. anorg. Chem., through Chem. Abstracts, 14 (1920), 3378.

Treadwell and Weiss state that the end point in many titrations may be determined electrometrically by measuring the terminal voltage between a metal electrode which is immersed in the solution being titrated, and is capable of sending the same ions into solution, and a comparison electrode made of the same metal and the titration product. The two terminals are directly connected to a voltmeter, and the point of zero potential is the end point of the titration. It is essential that during the titration the liquid should be rapidly stirred, and the authors describe an apparatus in which the comparison electrode is built up in the stirrer. In the case of silver solutions the comparison electrode is Ag/AgCl (saturated solution)||, a silver wire is the titration electrode, and the titration is carried out with sodium chloride. With pure silver solutions the results are exceedingly good, but in the presence of foreign substances low results are obtained, which may, however, be corrected from the titration curve. Hydrogen sulphide may be titrated with silver ions, using the combination Ag/Ag_2S dilute $NaNO_3$|| as comparison electrode. Mercurous ions may be titrated with chloride ions, using as comparison electrode $Pt.Ag./Hg_2Cl_2$ dilute H_2SO_4||, and a similar silver-plated platinum wire as titration electrode. Better results are obtained if the titration is carried out with bromide ions, and the calomel in the comparison electrode replaced by mercurous bromide. Copper ions may be titrated by ammonium thiocyanate, using as comparison electrode Cu/CuCNS dilute $NaHSO_3$||. Zinc ions may be titrated with ferrocyanide ions, using as titration electrode a platinum gauze, and as comparison electrode $Pt/Zn_2Fe(CN)_6HCl$. (5 mils in 300 H_2O)||. The titration in this case is carried out in warm solution (70° C). Ferrous chloride may be titrated with potassium bichromate, using an already completed titration as comparison electrode, and platinum wires in both solutions. This titration is also carried out in warm solutions. Uranous ions may be titrated with potassium permanganate in warm solutions, using platinum wires and a uranyl solution as comparison electrode. Vanadyl solutions may be similarly titrated with permanganate, using platinum wires and a vanadate solution as comparison electrode.—Helv. Chim. Acta, through J. Soc. Chem. Ind., 39 (1920), 137A.

Flame Tests.—*Substitute for Platinum Wire in.*—The platinum wire used for carrying out flame tests can simply and cheaply be replaced according to A. Ehringhaus by a strip of filter paper. To

test a solution, a strip of pure filter paper is folded several times and one end dipped in the solution. This end is then held in the outer flame of a Bunsen burner. If an insoluble salt is to be tested the strip is first dipped in dilute hydrochloric acid and a little of the salt is then sprinkled on the damp end. In either case a good, pure flame coloration is obtained, which lasts as long as the paper is prevented from burning by the moisture of the salt. A lasting, monochromatic flame can be obtained by dipping one end of a strip of paper in a vessel containing the dissolved salt, the other end being held in the Bunsen flame. The paper is prevented from burning by a crust of salt which soon forms.—Cent. Min., through J. Soc. Chem. Ind., 39 (1920), 315A.

Lead and Iron.—*Assay in Mixtures.*—Sacher proceeds as follows: One to two grammes of the material is dissolved in a slight excess of 25 per cent. nitric acid, the solution evaporated and the residue dried at 100° for 20 minutes. By this process the iron is converted into an insoluble basic nitrate, while the lead is present in the form of soluble nitrate. The residue is boiled for a few minutes with 50 mils of water, the mixture is filtered, the filter washed well with water and in the filtrate the lead is estimated in the usual way. The residue on the filter is dissolved in hot diluted hydrochloric acid and in the solution the iron is precipitated as ferric hydroxide and estimated as oxide.—Chem. Ztg., through Drug. Circ., 64 (1920), 64.

Manganese and Zinc.—*Criticism of Schmidt's Method of Assay.* —In the presence of phosphates, manganese is precipitated by ammonia and ammonium sulphide as manganese phosphate, which is insoluble in an excess of ammonia or ammonium salts. D. H. Wester, therefore, claims that Schmidt's method cannot be used for the assay of manganese because it places manganese in a group (iron, aluminum, chromium, alkaline earth) where it does not belong. Schmidt's process of assaying zinc is good. It can be used for manganese also when oxalates are absent.—Pharm. Weekbl., 57 (1920), 387. (H. E.)

Metallic Salts.—*Titration with Arsenate Solution.*—J. Valentin points out that the salts of magnesium, calcium, strontium, barium, zinc, cadmium, lead, manganese, nickel, cobalt, bismuth, alum-

inum, chromium, iron, copper and silver can be assayed volumetrically by adding to the solution of the salt a known excess of sodium arsenate solution, filtering the clear fluid from the resulting precipitate and titrating an aliquot portion of the filtrate for residual arsenate by the potassium iodide, hydrochloric acid, thiosulphate method.—Z. anal. Chem., through Pharm. Zent., 61 (1920), 151.

Perchlorate Assay Method.—*Danger of Explosion During.*—Joseph and Martin report on an explosion occurring during the potassium assay of papyrus. The assay was carried out by them as follows: After the removal of the silica the solution from the alkaline fusion of the papyrus ash was evaporated two or three times with a slight excess of perchloric acid and the potassium perchlorate separated in the usual way. The filtrate and the alcohol washings, containing the sodium and excess of perchloric acid, were evaporated in a beaker nearly to dryness, and then transferred to a porcelain crucible, the evaporation being finished on an electrically heated hot-plate. The residue was treated with sulphuric acid and the sodium finally weighed as sulphate. A number of estimations in this manner were made without mishap. On the last occasion, however, a violent explosion occurred during the evaporation on the hot-plate, when only 1 or 2 mils of liquid remained in the crucible. The force of the explosion produced a shallow cavity in the heavy top of the iron hot-plate ⅛ in. deep, the crucible being completely shattered and splinters driven with considerable force to a distance of 30 or 40 ft. Some of these splinters actually punctured bottles, flasks, and windows several yards away with holes about 1/10 in. diameter. Vessels close to the explosion were of course completely shattered.

They attribute the explosion to the presence of organic matter in solution.—J. Soc. Chem. Ind., 39 (1920), 94T.

Potassium Permanganate V. S.—*Stability of.*—It is generally claimed that volumetric potassium permanganate solutions rapidly deteriorate and that they have to be restandardized very frequently. Schimmel found that when the solution is allowed to stand for 2 to 3 months before being used, the clear liquid, when carefully decanted from the sediment and stored in well-stoppered bottles, does not appreciably change its titer even when kept for months.—Chem. Analyst., through Drug. Circ., 64 (1920), 460.

Salts.—*Testing for Acid and Alkaline Impurities.*—Salts of the Dutch Pharmacopœia were examined with various color indicators with a view to recommending the requirements with which they should comply. Standards of this character are proposed for the following: potassium acetate, sodium carbonate, potassium carbonate, sodium bicarbonate, potassium bicarbonate, sodium phosphate, sodium arsenate, sodium and potassium tartrate, antimony and potassium tartrate, sodium salicylate, sodium veronal, sodium glycerophosphate, sodium phenolsulphonate, zinc chloride, zinc sulphate, zinc phenolsulphonate, lead acetate, copper sulphate, ferrons sulphate, ferric chloride, aluminum sulphate and potassium alum.—Pharm. Weekb., through Chem. Abstracts, 14 (1920), 1408.

Spectrograph.—*Use in Drug Analysis.*—F. Twyman has had success in the detection of certain substances by means of absorption bands of the spectrum. Minute amounts of strychnine, cocaine, phenol, pyridin, and benzoic acid have been so detected. Twyman does not give any details as to the arrangement or operation of the apparatus.—Analyst, through J. Frank. Inst., 190 (1920), 591.

Turbidimetric Tests.—Stich submits details of methods of detecting traces of chlorides in official chemicals, by the opalescence produced by silver nitrate solution. The problem is not handled by the author as thoroughly as it was in recent U. S. P. revision work. (See J. Am. Pharm. Assoc. 9, 1920, 971).—Pharm. Ztg., 65 (1920), 1009.

Ultrafiltration.—*Use in Toxicological Analysis.*—Mannich and Wipperling describe a process of ultrafiltration and some uses thereof. They define "ultrafiltration" as a process which enables one to separate colloids from a colloidal solution. They employ as a filter a membrane prepared by pouring a solution of collodion upon a glass plate, allowing the solvent to evaporate to a certain point and then coagulating the residue by placing it in water for several hours. The membrane may then be removed from the plate. Suction must of course be used in connection with the filter. Experiments are then described in which alkaloids, metallic salts, potassium chlorate and oxalic acid respectively were brought into solution, either alone or in combination with albuminous organic matter and then subjected to such ultrafiltration in order to aid in their identifica-

tion. The results indicated that the membrane in many cases absorbed a considerable amount of the salt. This was especially true of alkaloids and mercury salts. For arsenic, antimony, potassium chlorate and oxalic acid the method, however, is recommended.—Ber. dtsch. Pharm. Ges. 30 (1920), 348. (H. H. S.)

Volumetric Assays.—*Three New Types.*—O. Sasse suggests the following:

Mercuric Chloride: Prepare a standard solution of potassium iodide, 8 grammes in 1000 mils. Prepare a carefully weighed solution of the mercuric chloride sample (2 grammes in 1000 mils) and titrate the iodide solution therewith until a permanent red color is produced. Each mil of the iodide solution (8 in 1000) represents 0.00296 gramme $HyCl_2$.

Chloroform: The weighed sample is converted into potassium chloride and formate by digesting with potassium hydroxide in a flask provided with an upright condenser. The fluid is then treated with sulphuric acid and manganese dioxide and the liberated chlorine is passed into potassium iodide solution. The iodine thus freed, is titrated with thiosulphate solution. Each mil of $^n/10$ thiosulphate represents 0.0039833 gramme $CHCl_3$.

Lead Salts: The weighed sample is dissolved in water and is then treated with a known excess of potassium dichromate solution. The lead chromate is filtered out and the chomate content of the filtrate is determined addition of potassium iodide and titration of the liberated iodine with $^n/_{10}$ thiosulphate.—Pharm. Ztg., 65 (1920), 559.

COMMERCIAL CHEMISTRY.

Chemical Industry.—*Development in Germany During the War.*—F. Dietze cites the recent chemical achievements of Germany during the war. He describes with considerable detail, the "Protol" method of obtaining glycerin from carbohydrates; the Willstätter method of attaining carbohydrates from sawdust; the Harries method of obtaining fatty acids from paraffins; the Fischer method of tannin synthesis and the production of cumarone resin as a substitute for natural rosin—D. A. Apoth. Ztg., 41 (1920), 75.

Chemicals.—*Argentine Trade in.*—B. H. Noll gives information concerning a number of chemicals which Argentina has obtained from the United States since the outbreak of the war. The information includes state of trade, kind and size of package, etc. The chemicals are caustic soda, 76 per cent.; soda ash; chloride of lime; silicate of soda; rosin; sulphur; paraffin wax; white arsenic; chlorate and bichromate of potash; sulphuric acid; glacial acetic acid, 99 per cent.; pharmaceutical drugs; dyes and colors.—Nat. Drug. 50, (1920), 135. (C. M. S.)

Chemicals.—*Moroccan Imports of.*—During 1918 Casablanca imported nearly 3,800 tons of chemicals, the largest item being raw material for soap-makers (potash, carbonate of potash and caustic soda.)—Chem. & Drug., 92 (1920), 592. (K. S. B.)

Phosphate and Manganese.—*Production in the Society Islands.*—Consul Howard F. Withey, Tahiti, says phosphate is the only mineral produced in or exported from the Society Islands. The phosphate exported is virtually the soil itself. It is dug with pick and shovel, taken to the works and put through a crushing and drying process. At the present time nearly all the phosphate is exported to New Zealand. Before the war much of it went to San Francisco. The soil shipped runs 80 per cent. phosphate. The annual production has reached as much as 90,000 metric tons.—Nat. Drug., 50 (1920), 427. (C. M. S.)

MISCELLANEOUS.

Chemical Reaction.—*Early.*—N. Asherson points out that one of the earliest written records of a chemical reaction is to be found in the Bible—in the Book of Exodus. It will be recollected that after their departure from Egypt the Israelites marched for three days before reaching the well of Marah. On rushing to quench their thirst they found that the water was quite bitter and undrinkable. Moses, however, acting under divine inspiration, rendered the water potable by casting into it the branch of a tree. Thus far the Bible. Dean Milman, in a book written in 1846, draws attention to the scientific explanation of this phenomenon. He relates that one Buckhart, travelling through the country in which the above took place, came across a well called Howara (the identification of this

with Marah is generally accepted). The water of the well was so bitter that neither men nor animals drank it. A sample of the water of a well near Howara was brought to England and analysed by a medical friend of Dean Milman, who gives the following account: "The water has a slightly astringent bitterish taste. Chemical examination shows that these qualities are derived from the selinite or sulphate of lime which it holds in solution and which is said to abound in the neighborhood. If, therefore, any vegetable substance containing oxalic acid (of which there are several instances) were thrown into it, the lime would speedily be precipitated and the beverage rendered agreeable and wholesome. The quantity of acid requisite for this purpose must be inconsiderable, as a pint of water, at its summer temperature in England, is scarcely capable of dissolving 20 grains of the selenite."—Chem. News, 120 (1920), 156.

Pharmacy.—*Value of Chemistry in.*—H. B. Fenwick points out that it is the pharmacist's duty to know chemistry for reasons enumerated below: In order to recognize and be able to avoid incompatibilities and formation of poisonous substances in prescriptions: In order to have a clear understanding and writing knowledge of the standardization and testing of the official preparations, drugs, and chemicals for purity.—Pharm. Era, 53 (1920), 233. (H. M.)

NON-METALLIC ELEMENTS

OXYGEN.

Oxygen.—*Therapeutic Value of.*—H. A. Ellis states that oxygen prepared from potassium chlorate and manganese dioxide, thus containing a trace of chlorine, is a hypnotic of considerable power, valuable in irritable heart with insufficient aëration. Cylinder oxygen, which the writer calls "dead oxygen," appears to be only convenient for administration during chloroform anesthesia. The third variety of oxygen which was experimented with therapeutically was obtained by dropping water on sodox, a form of dioxide of sodium. The result of administering oxygen in this form was a remarkable increase of metabolic action. "Sodium oxygen" is sufficiently active to necessitate careful regulation of the dose, and the best period of

administration varied from two to fifteen minutes. Sodium oxygen, he concludes, is evidently more active than the other forms of oxygen, and will be found to be a therapeutic agent of no mean order.—Lancet, through Chem. & Drug., 92 (1920), 748.

Ozone.—*Fallacies Concerning.*—B. Moore states that it is not the ozone in the atmosphere that gives the medicinal quality to the air, but nitrogen peroxide. He then lauds the disinfectant properties of nitrogen peroxide.—South. Pharm. J., 13 (1920), 74.

Hydrogen Dioxide.—*Properties of Absolute.*—Maass and Hatcher and Herzberg described the method of preparing absolute hydrogen dioxide and present the following table comparing its properties so far determined, with the corresponding properties of water.

Physical Constant	*Hydrogen Dioxide*	*Water*
Freezing point	—1.70°	0°
Density of liquid at 0°	1.4633	0.99987
Mean coefficient of expansion—		
—10° to +20°	0.00107	0.00000
Density of solid	1.644	0.9167
Specific heat of liquid	0.579	1.000
Latent heat of fusion	74 calories	80 calories
Specific heat of solid	0.470	0.472
Surface tension 0°	78.7 dynes	75.5 dynes
Association (Ramsay and Young)		
at 0°	3.48	3.58
Viscosity 0°	0.01828	0.01778
Refractive index (D) 22°	1.4139	1.3330
Molecular refractive power (D)	5.90	3.715

A second paper discusses the freezing points of solutions of hydrogen dioxide and water, showing the freezing point curve and also showing that a molecular compound, $H_2O_2\ 2H_2O$, with a melting point of —51° exists.—J. Am. Chem. Soc., 42 (1920), 2548 and 2569. (J. L. M.)

Hydrogen Dioxide.—*Assay of Solution of.*—A method for estimating hydrogen dioxide which can be used when organic substances are present in the liquid to be examined, is published by Von Bertalan. The method depends on the oxidation of stannous chlor-

ide to stannic chloride and to the reduction of methylene blue to the colorless leuco-dye by stannous chloride. In a measured quantity of the hydrogen dioxide solution, potassium bicarbonate is dissolved, diluted sulphuric acid is added in order to replace the air in the flask by carbon dioxide gas and after the addition of a small quantity of one per cent. methylene blue solution and of an excess of N/10 stannous chloride solution, the liquid is titrated with N/10 iodine solution until the blue color of the methylene blue reappears. Each mill of N/10 stannous chloride solution corresponds to 0.0017 gramme of H_2O_2. Since stannous chloride solution is rapidly oxidized if not kept properly, it is necessary to restandardize the solution against iodine solution previous to each estimation.—Chem. Ztg., through Drug. Circ., 64 (1920), 340.

Hydrogen Dioxide.—*Extemporaneous Manufacture of Solution of.*—For making a solution of hydrogen dioxide corresponding to 10 volumes of oxygen, Hague recommends dissolving 170 grammes of sodium perborate and 60 grammes of citric acid in sufficient water to obtain 1000 mils, filtering the solution and keeping the liquid in well-stoppered bottles.—Boll. farm., through Drug. Circ., 64 (1920), 298.

Hydrogen Dioxide.—*Impurity in Solution of.*—A quantity of this was received by J. H. Ramsay, showing a decidedly milky appearance, and on standing a thin white deposit covered the bottom of the vessel. The B. P. directs that the solution should give no reaction for barium. As a matter of fact, this solution gave no reaction for barium, but gave positive results when the tests for calcium were applied. The source of this contamination was not ascertained. Treated in the nitrometer oxygen was evolved equivalent to only 8.3 volumes from 1 of solution. It was therefore evidently not a satisfactory sample.—Pharm. J., 104 (1920), 8.

Hydrogen Dioxide.—*A New Reaction of.*—K. Spiro reports that when phenol is treated with tenth-normal hydrogen dioxide and then with hundredth-normal ferrous sulphate, an intense green color is obtained; due to the oxidation of the phenol to pyrocatechin and of the ferrous salt to the ferric form; the two products then reacting with each other. By means of this test, Spiro was able to

detect 0.000017 gramme of hydrogen dioxide.—Z. anal. Chem., through Pharm. Zent., 61 (1920), 300.

Hydrogen Dioxide.—*Preservation of Solutions of.*—After taking certain precautions several samples containing different preservatives were tested by H. R. Jensen at different intervals: eight days; 12 weeks; and four years. Jensen found that a high degree of purity really favored stability. The presence of a minute quantity of simple preservatives such as acetanilid and hydrochloric acid, also aided preservation.—Pharm. J., 105 (1920), 86. (J. M. W.)

Magnesium Peroxide.—*Therapeutics of.*—Dr. G. Sandberg finds magnesium peroxide (*magnesium perhydrol*, as he calls it) of marked value in stomach and intestinal disorders.—Therap. Gegenw., through Pharm. Ztg., 65 (1920), 252.

Perborates.—*Assay of Active Oxygen in.*—H. Trickett examined the three methods generally applied for the estimation of peroxides and arrived at the following conclusions, as far as perborates were concerned:

I. The permanganate methods carried out (1) by adding an excess of permanganate solution and titrating back with oxalic acid, (2) titrating directly, and (3) estimating gasometrically, gave unsatisfactory results.

II. The potassium iodide method gave better results. As the optimum concentrations were found a solution of the perborate in water 1:40, 10 per cent. hydrochloric acid and sufficient potassium iodide to contain a final concentration of 1 per cent. KI. It is, however, necessary when assaying soap powders, containing perborates, to first remove the soap and other admixtures. This is not necessary when applying.

III. The gasometric method with hypochlorite. This is carried out by triturating 300 mgm. of sodium perborate or an equivalent amount of the soap with 20 mils of water, transferring the mixture to the nitrometer and then pouring 15 mils of the chlorinated lime solution into the apparatus. The volume of oxygen is read after allowing the mixture to stand for five minutes. Analyst, through Pharm. Weekblad 57 (1920) 745. (H. E.)

HYDROGEN AND HELIUM.

Hydrogen.—*Structure of.*—F. H. Loring presents a speculative argument showing that it is within the realm of possibility for the hydrogen atom to be complex and consist of three parts; a whole-number part (A), an auxilary part (B) and a rotating electron (C). —Chem. News, 121 (1920), 315. (J. H.)

Hydrogen.—*Triatomic Form of.*—Wendt and Landauer call attention to the fact that a reactive modification of hydrogen has been produced by several methods, all dependent on gaseous ionization—by the X-rays from radium emanation, by the electrical discharge under reduced pressure, and by the high potential corona at atmospheric pressure. Attempts to produce activation by Schumann light rays failed.

This active hydrogen reduces sulphur, arsenic, phosphorus, mercury, nitrogen and both acid and neutral permanganate. It is condensed or destroyed by liquid air temperatures. It is unstable and reverts to the ordinary form in about a minute. It passes readily through glass wool. It is not less stable at atmospheric pressure than at low pressures.

The activity is not due to gaseous ions, and the properties of the active gas are quite different from those of Langmuir's atomic hydrogen. The formation of a polyatomic molecule is indicated by the contraction of the hydrogen when ionized. Positive ray analysis at very low pressure shows a large proportion of triatomic molecules which are undoubtedly the ones responsible for the chemical activity. All the properties of the gas point to its being an ozone form, perhaps properly called *"hyzone."*

The existence of H_3 is applied to the explanation of several previously observed phenomena. The calculations of Bohr or the basis of Rutherford's atom furnish the only valence hypothesis which satisfactorily accounts for its existence.

The mechanism of the formation of triatomic molecules is considered on the basis of the Bohr atom. Stable molecules of hydrogen are perhaps dissociated into free atoms when an electron is removed in the process of ionization and these atoms attach themselves to neighboring neutral molecules to form triatomic systems. —J. Am. Chem. Soc., 42 (1920), 930. (J. L. M.)

Hydrides.—*Gaseous.*—F. Paneth points out that the discovery of volatile hydrides of tin, lead, bismuth, and polonium makes it possible to divide the periodic table into two portions, such that all the elements in one portion, and only one element, boron, in the other portion, form volatile hydrides. In other words, the four elements immediately preceding a noble gas in the table, and, in addition, boron, all form volatile hydrides.—Ber., through J. Soc. Chem. Ind., 39 (1920), 748A.

Water.—*Assay of Chlorides in.*—F. Malméjac publishes complete sanitary reports of 25 samples of waters of Champagne and the Argonne examined by him during the World War. His conclusions are that the chloride content of the water is the most valuable indicator of its potable value.—J. pharm chim., 21 (1920), 263.

Water.—*Influence of Chemical Denitrification of.*—Some years ago, Marpmann claimed that nitrogen may be split off from nitrogenous substances without the action of bacteria. This appeared very plausible because on account of the indifferent character of the nitrogen many nitrogenous products, such as the diazo compounds, are very labile and give off nitrogen very readily. Nitrogen is also evolved by heating a solution of ammonium nitrate. This is quite interesting because in many waters both nitrates and ammonia are present, and the action of these on one another is quite slow. K. Scheringa found that some substances, especially some aniline dyes, such as malachite green, fluorescein and methyl red hasten the action of nitrates on ammonia, while other substances, especially colloids, retard or even inhibit it. Thus sterile clay had no influence on the decomposition. Since in the soil numerous colloidal substances are present, the loss in nitrogen does not amount to much. In drinking water also a great many organic substances are present, which act as protective colloids, which accounts for the simultaneous presence of both nitrites and ammonia. Some loss in nitrogen may occur in manure, but this is negligible.—Pharm. Weekbl., 57 (1920), 1487. (H. E.)

Water.—*Determination of Small Amounts of Indican in.*—A. Jolles points out that the examination of wells and springs in order to determine the hygienic value of water is very often an expensive matter because of the time and traveling required. He also

states that the bacteriological examination of water is very often of questionable value and occasionally gives dubious results. He then points out that indican has never been found anywhere except in the urine and blood of humans and mammals and that its presence in water therefore would be proof of pollution. He describes various experiments upon the behavior of this substance in urine and water. The best method of determining indican in water is as follows: 3000 to 4000 mils water are evaporated to 10 mils, filtered, and 1 mil of 5 per cent. thymol or freshly made alpha-napthol solution is added followed by 10 mils of fuming hydrochloric acid per liter. Allow the mixture to stand for 15 minutes wtih occasional shaking, add 4 mils of chloroform and agitate. If indican is present, the chloroform will be colored violet with thymol and blue with napththol. If nitrates are present in the water, a slight modification of the process must be employed.—Ber. dtsch. Pharm. Ges., 30 (1920), 421. (H. H. S.)

Water.—*Detection of Lead in.*—G. K. A. Nonhebel employed the following nephelometric method to detect even so little as 0.2 milligramme of lead in 100 mils of a water sample. To this volume of water are added 1 drop of potassium chromate solution (strength not given) and one drop of acetic acid. A turbidity indicates the presence of lead. If no turbidity is shown, throw a light from a microscope or bicycle lamp through the solution, when if any lead is present, the turbidity will become apparent.—Pharm. Zent., 61 (1920), 481.

Water.—*Purification by Freezing.*—K. Schierholz suggests that a hard water may be made soft without expense in the winter by filling tanks with the water and after about three-quarters are frozen, draining off the portion that is still liquid. This portion contains practically all of the chlorides, nitrates, sulphates, carbonates and silicates of the alkali and alkaline earth metals; while the ice upon melting is a water that is almost as pure as that produced by distillation. Schierholz calls his process, *cryalyse.*—Pharm. Post, through Pharm. Zent., 61 (1920), 113.

Helium.—*Production of.*—A short comparison of three experimental helium plants described in Bulletin No. 178C. of the U. S.

Bureau of Mines. In the Linde process (Plant 1) an enormous expenditure of power is demanded and most of this energy is wasted after throttling, the Claude process (Plant 2) requires much less compression power but the energy stored in the compressed gas is also dissipated. In the Norton process (Plant 3) with which it is confidently expected to produce helium of the highest purity on a large scale, the requirements for compression is reduced to a minimum by the interpolation of multiple expansion engines, and what is needed is conserved and re-applied through the energy developed by these engines thereby obtaining a maximum cooling effect at minimum cost.—Chem. News, 120 (1920), 10. (J. H.)

Helium.—*Production in Canada.*—At a meeting of the Chemical Society, J. C. McLennan outlined the history of helium and then described his work during the war in extracting that gas from Canadian natural gas. He pointed out that at the wells at Bow Island this is annually available 10,500,000 cubic feet of helium. To extract this successfully would mean the erection of a plant costing 100,000 pounds sterling. If such a plant were erected the helium should be extracted at the cost of 2½ pence per cubic foot.—Chem. & Drug., 92 (1920), 845.

HALOGENS.

Chlorides.—*Color Reaction for.*—F. Klein suggests the following test: To the "Iron Reagent" (given below) is added 10 per cent. sodium hydroxide solution, then the chloride solution to be tested and then an equal portion of concentrated sulphuric acid. When chlorides are present an intense canary-yellow color is obtained. Other inorganic and organic acids do not give this coloration.

The "Iron Reagent" is made by dissolving one gramme of crystalline ferrous sulphate in two mils of water and then adding 10 to 15 mils of 3 per cent. hydrogen dioxide solution and an equal volume of glycerin.—Pract. Drug., 39 (July, 1920), 39. (J. M. W.)

Hydrochloric Acid.—*Assay in the Gastric Juice.*—When the gastric juice is titrated with volumetric alkali solution and methyl orange as indicator, too high results are obtained on account of the presence of lactic acid. Correct results are obtained by using Gűnz-

burg's reagent as indicator but in this case spotting is necessary. However, Kelling found that hydrochloric acid alone can be estimated when using methyl orange as indicator, when to the gastric juice before the titration one and one-half volumes of alcohol are added, by which lactic acid is dissociated in such a way as to no longer act as acid. Five mils of gastric juice are mixed with two drops of an alcoholic methyl orange solution and 7.5 mils of alcohol and the mixture is titrated with n/10 caustic potash solution. If more than 2.5 mils of the latter is used, more alcohol should be added.—Berl. Klin. Wochensch., through Pharm. Weekbl., 57 (1920), 164. (H. E.)

Hydrochloric Acid.—*Production from Chlorine and Water.*—H. D. Gibbs states that chlorine and water vapor may be made to react forming hydrochloric acid and carbon dioxide at temperatures between 0°C. and about 130°C. in the presence of certain charcoals, and that the speed of the reaction has been found to be greatly influenced by the concentration of the water and chlorine, temperature and the character of the charcoal.—J. Ind. Eng. Chem., 12 (1920), 538. (L. A. B.)

Iodine.—*As Grippe Preventative.*—Iodine in form of potassium iodide has been considered an influenza preventative for some time. J. Pletsch recommends the following procedure: Pour tincture of iodide on a plate and by tilting from side to side spread the tincture to a thin layer. On evaporation of the alcohol, the elemental iodine remains. Inhale the iodine vapor two or three times a day, raising the plate close to the nostrils. Tincture of iodine can also be used for disinfecting sickrooms by keeping iodine plates about the rooms and replenishing the tincture occasionally. The same method can also be used in offices and factories and the employes should be instructed to inhale iodine vapor on entering and leaving. —Dtsch. Med. Wsch., through Pharm. Zent., 61 (1920), 374. (O. M.)

Recently, attention has been directed to the administration of iodine in the form of vapor. Luckhardt reports that they are rapidly and completely absorbed. It was found that the administration of iodine through the respiratory passages even in small quantities is fraught with great danger. Such administration induces

dyspnea, and when it is given in large quantities, acute and fatal pulmonary edema ensues within twenty-four hours. When respiratory disorders are present at the time of the administration, the fatal edema supervenes very quickly.—J. Am. Med. Assoc., 74 (1920), 1521. (W. A. P.)

Iodine.—*Assay in Certain Drugs.*—Van der Wielen and Wientjes compare the Hunter and Dupré and the Ostwald methods of iodine assay. They find that with proper precautions the Dupré method is sensitive to 0.01 milligramme of iodine.—Pharm. Weekbl., through Chem. Abstracts, 14 (1920), 2967.

Iodine.—*Test Paper for.*—Test paper for the detection of iodine may be made by shaking one gramme of starch with 10 mils of water and adding to the suspension 40 mils of boiling water. The mixture is then boiled two minutes and 0.5 gramme of sodium nitrite is added. With the paste, thus obtained, sized paper is painted. For the detection of iodine, sufficient of the solution under examination is placed on the paper to moisten it and then one drop of diluted sulphuric acid, when in the presence of iodine a blue color is developed.—J. Pharm. Belg., through Drug. Circ., 64 (1920), 22.

Iodine.—*Use in Colds.*—J. Fink finds that iodine solutions are of marked value in the treatment of colds and of angina. He prescribes a solution of 0.3 gramme of iodine, 3.0 grammes of potassium iodide and 30 grammes of water. This he administers in 5 drop doses to children up to 10 years old and in 8 to 10 drop doses to older children and adults, in each case diluting the dose with a quarter glass of water.—Münch. med. Wsch., through Pharm. Ztg., 65 (1920), 511.

Iodides.—*Titration with Mercuric Chloride.*—It is a well-known fact that the accuracy of this titration depends largely on the dilution and that the temperature has very little influence on it. I. M. Kolthoff found that the presence of other substances, such as sugar, alcohol, sulphuric acid, etc., influence the titration and he, therefore, criticises the method given by the Dutch Pharmacopœia for estimating the iron iodide in the syrup of iron iodide. It is directed that 5 grammes of the syrup be diluted with 10 mils of water and that the solution be titrated with n/10 mercuric chloride solution.

For this purpose about 8 mils of the latter solution are used, thus making the final volume 23 mils. According to his experiments a correction of .35 mils of n/10 mercuric chloride solution should be applied. This correction is somewhat smaller in the presence of sugar and amounts to about .1 to .5 mil. He, therefore, advocates that the Pharmacopœia give specified limitations.—Pharm. Weekblad, 57 (1920), 836. (H. E.)

Iodized Oil.—*Use in Intravenous Injections.*—Having found that peanut and poppyseed oil could be injected intravenously without danger, Rathery and Cartier use these to prepare a 40 per cent. oleaginous solution of iodine, which they have used with marked success in rheumatism and syphilis. They give 4 injections of 0.5 to 1.5 mils of the iodized oil during 8 to 15 days.—J. pharm. chim., 22 (1920) 363.

Hypoiodous Acid.—*Assay in Acid Solution.*—The fact that hypoiodous acid, but neither free iodine nor any other iodine compound, gives stable iodo compounds almost instantaneously with phenols forms the basis of the following method for the estimation of this acid, suggested by V. Cofman. To a measured volume of the solution under examination potassium iodide is added, the solution is acidified, if necessary, and titrated with standard thiosulphate. The operation is then repeated, but this time an excess of phenol is added before the potassium iodide. The difference in the amount of iodine found by the two titrations is a measure of the amount of hypoiodous acid present.—Bull. Soc. Chim., through J. Soc. Chem. Ind., 39 (1920), 363A.

Iodic Acid.—*Microchemical Reactions of.*—A. Bolland gives a description of the appearance under the microscope of the precipitates given by iodic acid with the following reagents:—Thallium nitrate, silver nitrate, barium chloride, strontium acetate, calcium acetate, rubidium chloride, cæsium sulphate, rubidium-cadmium chloride, potassium chloride, sodium acetate, ammonia, manganous chloride. The first two reagents give a precipitate with iodic acid diluted to 1 in 5000, the next with 1 in 2500, the next three with 1 in 300, whilst for the remainder the dilution should not be more than 1 in 80 and preferably about 1 in 20.—Compt. rend., through J. Soc. Chem. Ind., 39 (1920), 819A.

Sodium Fluoride.—*Poisoning by.*—C. Valléé reports the poisoning of seven persons in one family after eating pastry to which sodium fluoride had been accidentally added by the baker instead of sodium bicarbonate. The pieces of pastry were found to contain 3.42 grammes of sodium fluoride apiece. Six of the persons ate one piece, while the seventh ate two. All recovered after 48 hours of distress.—J. pharm. chim., 21 (1920), 5.

SULPHUR, SELENIUM AND TELLURIUM.

Sulphur.—*A Preventative of Mercurial Stomatitis.*—The administration of a teaspoonful of sublimed sulphur, nightly, to patients before and while undergoing mercurial treatment for syphilis is found to obviate all the unpleasant buccal symptoms of mercurialism. It also rapidly improves the condition of those patients who are actually suffering from the effects of the mercurial treatment. In the opinion of G. Irving the use of sulphur renders a visit to the dentist unnecessary as a preliminary to mercurial medication.—Brit. Med. J., through Pharm. J., 94 (1920), 304.

Sulphur.—*Alaskan.*—In the crater of a snow-capped volcanic mountain on Unalaska Island, one of the Aleutian group, is a large deposit of sulphur, believed to contain from 10,000 to 15,000 tons. A claim has been filed for the location, and mining operations probably will start in the near future. Subterranean heat and a hot vapor, the latter issuing from cracks in the rocks, keep the deposit free from ice and snow, though these permanently cover nearly all of the remainder of the peak, which is about 6,000 feet in height. Another sulphur deposit has been discovered on Akun Island, in the same group, and a third near Stepovak Bay, on the southern shore of the Alaskan Peninsula.—Pract. Drug., 39 (June, 1920), 36.

Sulphur.—*Sicilian.*—A description of the Trabonella sulphur mine, said to be the largest in Europe, and thirty kilometers long, is given by Mr. Festing Jones, in his "Castellinaria and other Sicilian Diversions." The Trabonella miners do not get their sulphur for nothing, for they pay for it, almost literally, with their lives, but in other respects the mine is a sort of replica of the infernal regions.

> No light, but rather darkness visible
> Serves only to discover sights of woe.

"Day after day (says Mr. Jones), always the same monotonous groaning and moaning, always the same monotonous pickaxing the rock in the dim light, always the same monotonous sending up the broken pieces." As in Milton's hell, "it was very hot in some places, and very cold in others," but the only Lethe of these miners is the drink-shops outside, which are their alternative to the toil which warps and cripples them in body and mind, till they are incapable of further toil, or, as often happens, a fall of rock puts an end to them and it together. Mr. Jones asked whether shorter hours, better pay, and better conditions of labor were not possible. "But what of the price of sulphur?" was the reply.—Chem. & Drug., 93 (1920), 995.

Sulphur.—*Sicilian Exports.*—Sicily exported 147,286 tons of sulphur during 1919, compared to 231,390 tons in 1918. Of this, 40 per cent. went to France, and the balance to Greece, Turkey, Spain, the United Kingdom and South America.—Chem. & Drug., 92 (1920), 826. (K. S. B.)

Sulphites.—*Assay of.*—H. I. Waterman finds that the oxidation of sulphite solutions in air is especially rapid in presence of hydroxyl ions; for example, in solution of normal sodium sulphite. Sulphite may be accurately assayed by dissolving the salt in a boiled 5 per cent. glycerol solution in a flask filled with carbon dioxide. A measured quantity of this solution is run into a known volume of acidified standard iodine solution under carbon dioxide. The excess of iodine is titrated with thiosulphate.—Chem. Weekbl., through J. Soc. Chem. Ind., 39 (1920), 485A.

Sulphuric Acid.—*De-Arsenication of.*—In removing arsenic from sulphuric acid (95 per cent. H_2SO_4 containing 0.15 per cent. As_2O_3) it was found by T. S. Moore, that the process was slow, that excessive reduction of sulphuric acid occurred, the strength of the resulting acid being 91.8 per cent.; that if filtration from the arsenic trisulphide is carried immediately after the precipitation the arsenic content is 2 to 3 parts As_2O_3 per million, but that the arsenic content is higher the longer filtration is delayed. It was also noticed that if hydrogen sulphide is passed through the liquid during filtration the arsenic content falls to less than 1 part As_2O_3 per million.—Am. J. Pharm., 92 (1920), 179. (J. K. T.)

The following process for obtaining arsenic-free sulphuric acid is given by K. Scheringa. When the sulphuric acid contains much arsenic acid, it is heated with the addition of a sulphite in such a way that continuously water vapors are driven off. By doing so most of the arsenic is removed. The acid is then diluted with an equal volume of water and into the mixture a weak electric current is conducted. After one day practically all the arsenic has been elimiated and after a few days it is absolutely free from the metalloid. —Pharm. Weekblad, 57 (1920), 421. (H. E.)

Sulphuric Acid.—*Decolorizing.*—Sulphuric acid which is colored brown or even black by the presence of oxides of nitrogen can easily be decolorized by the addition of lead peroxide or barium peroxide, according to Rosenstand-Woeldike. The nitrogen oxides are oxidized in nitric acid by the hydrogen dioxide which is liberated from the peroxides and the lead or barium are precipitated as insoluble sulphates. Only a very small amount of peroxide, 0.01 to 0.001 per cent., is necessary to decolorize ordinary acid, while about one per cent. is necessary for an almost black-colored acid.—Chem. Ztg., through Drug. Circ., 64 (1920), 298.

Sulphuric Acid.—*Gravimetric Assay of.*—Winkler finds that the presence of ammonium chloride to some extent decreases the interference of magnesium, zinc, manganese, and other salts on the precipitation of sulphuric acid as barium sulphate. Tables are given which show the corrections to be made for the effect of alkali chlorides on the precipitation. In solutions containing alkali sulphates or magnesium sulphate, the sulphuric acid is most accurately determined by adding 1 gramme of ammonium chloride and 1 mil of N/1 hydrochloric acid to 100 mils of the solution, boiling the mixture (a fragment of metallic cadmium is added to ensure smooth boiling), and then adding a slight excess of 10 per cent. barium chloride solution. The barium sulphate is collected after 18 hours, washed first with 25 mils of cold water, then with hot water, dried at 130°, and weighed, or the precipitate may be ignited before being weighed. The weight is corrected from tables to obtain the actual amount of barium sulphate.—Z. angew. Chem., through J. Soc. Chem. Ind., 39 (1920), 584A.

Aromatic Sulphuric Acid.—*Assay of.*—After trying several methods, including that of the U. S. P., Kelly and Krantz finally devised a method which gave very satisfactory results and they recommend that the pharmacopœial method be modified as follows: "Accurately weigh about 5 mils of aromatic sulphuric acid and transfer to a tall beaker. Add 30 mils of normal sodium hydroxide and evaporate the mixture to complete dryness on a sand bath. Dissolve the residue in 20 mils of distilled water and titrate the excess of alkali with normal sulphuric acid-methyl orange T. S. as indicator. Each mil of normal sodium hydroxide used corresponds to 0.049045 Gm. H_2SO_4." This overcomes error due to incomplete decomposition of the acid ethyl sulphate.—J. Am. Pharm. Assoc., 9 (1920), 775. (Z. M. C.)

Selenium.—*Assay in Organic Compounds.*—F. Wrede burns the substance in a tube in oxygen in presence of platinum as catalyst and the selenious acid formed is titrated with N/100 sodium hydroxide solution, sodium hydrogen selenite being neutral to methyl orange. When both sulphur and selenium are present, the mixed sulphuric and selenious acids obtained are titrated and the sulphuric acid then estimated separately as barium sulphate. If the substance contains either nitrogen or a halogen, titration is useless, and the selenious acid may then be reduced by means of sodium sulphite in presence of a large amount of hydrochloric acid and the selenium thus formed weighed. The combustion is carried out in a so-called bead-tube (Pregl, "Die quant. org. Mikroanal.," 1917, 107) of about 7 mm. bore, the beads, previously moistened with water, serving for catching the selenious acid. In the empty part of the tube are placed one or two 5 cm. "stars" of thin platinum foil, the boat containing the substance lying between the "stars" and the end of the tube. The flow of oxygen should be 8—10 mils per minute. Over the capillary end of the tube an Erlenmeyer flask is inverted, and into this the selenious acid is subsequently washed. Before being used for the first time the combustion tube is treated with caustic alkali solution and then with acid and is finally rinsed out thoroughly with freshly boiled distilled water to which methyl orange and dilute acid or alkali have been added until it is just not pure yellow; the excess of water is blown out, but the tube is not dried. The ignited platinum stars and the boat are introduced, the tube at the stars being heated to bright redness and the substance burnt very slowly.

The selenious acid separates in shining white crystals at the beginning of the beads, the appearance of red selenium or of carbon indicating too rapid combustion. The acid is rinsed out into the Erlenmeyer flask by means of the methyl orange water and the solution titrated with N/100 sodium hydroxide solution. If sulphur, as well as selenium, is present, the bead tube is moistened, before combustion with neutral 5 per cent hydrogen dioxide solution, the combustion being carried out as usual. The platinum "stars" are ignited after each combustion or etched with aqua regia, as they often become coated with a thin layer which reduces their catalytic action. The method gives good results with small quantities (0.02—0.06 gramme) of substance.—Z. physiol. Chem., through J. Soc. Chem. Ind., 39 (1920), 707A.

Selenium.—*Manufacture of Colloidal.*—For making colloidal selenium J. Meyer recommends allowing sulphuric acid to act on sodium seleno-sulphate according to the equation:

$$Na_2SeSO_3+H_2SO_4=Se+SO_2+H_2O+Na_2SO_4$$

The sodium seleno-sulphate is obtained by boiling selenium with a concentrated solution of sodium sulphite. The orange-yellow colloidal selenium solutions are perfectly transparent, even in reflected light, while the dark-red colored solution, on account of the larger selenium particles, are slightly opalescent. When gelatin is dissolved in colloidal selenium solution (one sheet to one liter) the separation of the metalloid by boiling or by the addition of salt solutions is considerably retarded or even inhibited. When to colloidal selenium solution ammonia water and aluminum sulphate solution (one mil for each liter) is added, the aluminum hydroxide carries down all the selenium and is colored strongly red, while the supernatant liquid becomes colorless. A colloidal selenium solution may also be obtained by dissolving selenium in hydrazine hydrate. This solution is slightly alkaline while that prepared from sodium seleno-sulphate is slightly acid. When well-dialysed solutions obtained by these two processes are mixed, a separation of the selenium takes place, because the solutions are charged electrically differently, the acid solution being charged positive, the alkaline negative.—Ber., through Pharm. Zent., 61 (1920), 249. (W. E.)

Selenium and Tellurium.—*Action of their Acids on Bacteria.*—The ions of tellurous and selenous acids are much more active than

those of telluric and selenic acids. The growth of moulds is hardly affected by the action of tellurites and tellurates. Bacteria, especially of the typhus-coli group, are, on the other hand, very sensitive to the action of these substances. G. Joachimoglu suggests the application of tellurium compounds in the chemotherapy of typhoid infection.—Biochem. Zsch., through J. Soc. Chem. Ind., 39 (1920). 704A.

Selenium and Tellurium.—*Use in Medicine.*—The use of the various compounds of selenium in medicine has received some attention, but the derivatives have had almost no systematic study. In a very careful investigation Prof. W. J. Gies, of Columbia University, has shown that tellurium compounds have a physiological action quite similar to that of arsenic but that their toxicity is much less. The selenides and tellurides as well as the oxidized salts have been experimented with in cancer, tumors, and syphilis, but their efficacy is more or less questionable. These few compounds which are of the simplest chemical character are almost the only ones of which any experimental results are recorded.—Pharm. Era, 53 (1920), 209.

Tellurium Nitrite.—F. Von Oefele describes his experiments on the action of nitric acid upon the element, tellurium. Even after six years, with several renewals of the nitric acid, all of the element has not been entirely dissolved. An interesting tellurium compound that was obtained by his experiments was the nitrite. This occurs in the form of a flesh colored powder that can be used as a 10 per cent. ointment in cancer.

The article also discusses the use of selenium and tellurium compounds in cancer.—Pharm. Ztg., 61 (1920), 491.

NITROGEN.

Nitrites.—*Color Reaction of.*—L. Thevenon places in a test tube several mils of 10 per cent. sodium nitrite solution, then 6 to 7 drops of 30 per cent. acetic acid, followed by 2 to 3 mils of a solution of 0.5 gramme of paramidophenol hydrochloride in 100 mils of distilled water. A red color, due to the formation of diazophenol, is produced. Thevenon finds the test sensitive enough for testing

for nitrites in drinking water, none of the other ordinary ingredients of which will show the coloration when so treated.—J. pharm chim., 22 (1920), 336.

Nitrites.—*Detection and Assay in Meat Products.*—J. Prescher extracts 30 grammes of the comminuted meat with 100 grammes of water to which one mil of diluted sulphuric acid has been added, applying a gentle heat in the extraction process. The mass is then filtered and to the filtrate Griess' reagent is added, when, in the presence of nitrites, a more or less brown color, due to the formation of Bismarck brown is produced, the intensity of the color varying with the amount of nitrites present. Griess' reagent is prepared by dissolving 0.5 gramme of meta-phenylenediamine in 30 mils of water, adding 3 mils of diluted sulphuric acid and sufficient water to obtain 100 mils. For the quantitative estimation 30 grammes of finely minced meat is extracted with 100 mils of water containing sodium carbonate, the mixture is then acidulated with sulphuric acid and sufficient water is added to obtain a total weight of 150 grammes. It is then filtered and an aliquot part of the filtrate is treated as given above and the color is compared with those obtained by treating solutions of silver nitrite of known strengths with Griess' reagent.—Pharm. Zent., 61 (1920). 64. (H. E.)

Nitrites.—*Sensitive Reaction of.*—P. H. Hermans (See YEAR BOOK, 1919, 369), reported on a very sensitive reaction of manganese by means of oxalic acid and nitrite in the presence of an oxidizing agent by which a complex alkali-mangani-oxalate is formed. He further pointed out that by reversing the reaction it might be used for the detection of nitrites. This is best done by adding to 2 mils of the solution under examination a few drops of glacial acetic acid, 2 mils of a 5 per cent. potassium oxalate solution, one mil of a 5 per cent. manganese sulphate solution and a few drops of hydrogen dioxide solution, when in the presence of as little as 0.002 per cent. of nitrite a red color will be produced. Lead oxide may also be used as oxidizing agent, but dichromate, as recommended by Caron and Raquet, is less suitable on account of its color.—Pharm. Weekbl., 57 (1920), 462. (H. E.)

Nitrates.—*Sensitive Reaction of.*—F. Hahn points out that an extremely sensitive reaction of nitrates is their reduction by warm-

ing with lead acetate and metallic lead followed by treatment of the resulting nitrite with the diazo reagent. The only trouble with the test is the fact that the traces of nitrates in most chemicals produce a faint rose color when the test is applied. Hahn states that by means of this test, one millionth of a milligramme of nitrate in 1 mil of solution may be detected.—Pharm. Zent., 61 (1920), 619.

Nitric Acid.—*Use in Tests.*—Klein and Bruns write of the usefulness of strong nitric acid. They enumerate approximately 125 reactions with nitric acid, including three tests on protein egg albumin. They also give a bibliography of their subject.—Pract. Drug., 39 (Dec., 1920), 25. (H. M.)

Ammonia.—*Microchemical Detection of.*—G. Denigés finds that if a very small drop of iodic acid (10 per cent. aqueous solution) on the tip of a glass rod is exposed for a few seconds to the vapor of ammonia minute cubical and very characteristic crystals are formed, which are easily seen if the drop is transferred to a slide and examined under the microscope. The ammonia in very small quantities of ammoniacal salts in solution can be detected in the following way: Take a short glass tube (not more than 3 to 4 cm. long and 15 to 16 mm. wide) with the edge bent outwards so that it can be supported by the rim in a small flask. Evaporate the solution to be tested to about 1 mil, introduce it into the tube, add 0.5 gramme of calcined magnesia. On a microscope slide spread out a drop of 10 per cent. iodic acid to a thin film, invert this over the tube, and let it stand. If the solution contains 1 mgm. of an ammonium salt the crystals will appear in a few minutes; with 0.1 mgm. in about an hour. The crystals are normal ammonium iodate.—Bull Pharm. Soc. Bordeaux, through Pharm. J., 105 (1920), 323.

Ammonia.—*Synthetic Production from Calcium Cyanamide.*—Using an apparatus consisting of a horizontal autoclave, a Feldmann's column, and a locomotive boiler, J. Baumann found that 100 kg. of calcium cyanamide required 331 kg. of steam. The heat balance sheet showed a loss amounting to 7.7 per cent. of the heat supplied, which is probably to be attributed to the endothermic character of the reaction. The heat unaccounted for, in working up 13,200 kg. of calcium cyanamide, amounted to 2,366,800 cals. It is estimated that, using a plant such as that described in G. P.

251,934 the steam consumption could be reduced to 126 kg. per 100 kg. of calcium cyanamide.—Chem. Ztg., through J. Soc. Chem. Ind., 39 (1920), 401A.

Ammonia.—*Synthetic Production of.*—R. S. Tour discusses the physics, chemistry and industrial problems connected with the Haber ammonia process, as developed by the Nitrate Division of the Ordnance Department of the U. S. Army. The article contains seven illustrations of U. S. Nitrate Plant No. 1 and has a bibliography of 27 titles.—J. Ind. Eng. Chem., 12 (1920), 844.

Ammonia.—*Synthetic Production in France.*—Prof. George Claudi, of Paris, read a paper before the French Academy of Science last week in which he said he would demonstrate the practical use of pressure above 1,000 atmospheres in the production of synthetic ammonia. Professor Claudi told the members that in the near future he would show them a small installation, capable of producing 200 liters (212 quarts) of liquid ammonia daily. He said he was able to get twenty times as much ammonia from the same amount of primary matter as was produced by the German chemist Haber by the latter's method.—Pharm. Era, 53 (1920), 8.

Ammonia.—*Synthetic Production in Italy.*—An enterprising American has secured from the Italian Government a concession for the utilization of 800 horse power [?—Ed.] of the falls at Terni, about 700 miles from Rome, and maintains that he can turn out a nitrogenous plant food for the Italian farmer at a cost as low as 1 lira per kilo (equivalent to $0.088 per pound, with the lira taken at its par exchange value of $0.193). It is said that an inspection of the plant seems to justify the high hopes of the promoter of the project. The production of ammonia through the agency of water power has already passed the experimental stage, and in describing the massive electric generators employed to serve the purposes of the new order of things. Commercial Attache Dennis, Rome, states that it was something new to enter a big manufacturing plant and find no raw materials whatever—no coal, iron, steel, lumber or textile fibres. The factors in the equation are simply water, air and electric energy. In the first stage of the process the water is decomposed into oxygen and hydrogen by electrolysis. The hydrogen is stored in tanks exactly like those employed in city gas works, and is then conveyed

from these tanks to a receptacle of the size and appearance of an upright hoisting-engine boiler. In this receptacle is carried out a process of which the details are kept secret and which constitutes the essence of the new method of producing synthetic ammonia. The last link in the chain of production is the application of tremendous pressure running up it is stated, to 250 atmospheres—to the resultant gaseous products. Ammonia issues from the factory in portable steel cylinders.—Pharm. Era, 53 (1920), 209.

Ammonium Sulphate.—*Melting Point of Normal.*—G. Caspari finds that when heated in an open tube, normal ammonium sulphate softens at about 310°, melts at 336° to 339°, and decomposes with evolution of gas at 355°. In a sealed tube it softens from about 360° and melts at 417° to 423°. The datum, 140°, recorded in the literature is based on a misunderstanding, and really refers to ammonium bisulphate.—Ber., through J. Soc. Chem. Ind., 39 (1920), 485A.

Ammonia, Nitrates and Nitrites.—*Colorimetric Assay.*—I. M. Kolthoff found that in the colorimetric determination of ammonia by means of Nessler's reagent, varying results are liable to be obtained, if the directions given are not strictly adhered to, if, for instance, an excess of the reagent is taken, etc. He, therefore, proposes estimating ammonia nephelometrically by means of a reagent consisting of a solution of 2.5 grammes of sodium chloride, 2.5 grammes of mercuric chloride, 8 grammes of sodium bicarbonate, 1.2 grammes of sodium carbonate and sufficient water to obtain 100 mils. The solution is allowed to stand, the clear liquid is decanted and 0.2 to 0.3 mil is added to 50 mils of water. The turbidity produced in the liquid by the formation of white precipitate is then compared nephelometrically, with ammonia solutions of known strengths, treated in the same way. For the estimation of nitrates he recommends a modification of Frederich's method. To a suitable quantity of the nitrate solution 0.5 mil of normal sodium chloride solution is added, the mixture is evaporated and the residue is heated with 2 mils of phenolsulphonic acid on a water bath for 20 minutes. The residue is taken up in water, the solution rendered alkaline with ammonia and the intensity of color produced in the liquid is then estimated in the usual way. Experiments to deter-

mine nitrates by means of brucine were not successful. For estimating nitrites a slight modification of the method given in the Codex Alimentarius was used. In 50 to 100 mils of the water under examination 100 mgms of Griess-Romijn reagent were dissolved, the solution was heated for five minutes at 55° to 60° and the color produced in the liquid was compared with those produced in nitrite solutions of known strengths heated with the reagent.—Pharm. Weekbl. 57 (1920), 1254. (H. E.)

PHOSPHORUS.

Phosphorus.—*Discovery of.*—H. Peters claims that evidence shows that Brand is the sole discover of phosphorus and Johann Kunckel's claim to the independent discovery is unfounded. It was disputed by Leibnitz, to whom the rapid spread of the knowledge and Brand's method of preparation is due. The discovery was made in 1669. Its use for practical purposes was at first hindered by its high cost. This was greatly reduced about a hundred years later, when phosphorus was prepared from bone ash by Gahn and Scheele. The first phosphorus matches, the so-called Turin candles, were introduced commercially at the end of the eighteenth century. At the beginning of the nineteenth century the first phosphorus and sulphur matches were made on a small scale, but the actual considerable production of phosphorus matches dates from 1833.—Promotheus, through Pharm. J., 104 (1920), 369.

Red Phosphorus.—*Use as a Reducing Agent.*—Ludwig Rosenstein calls attention to the fact that in qualitative analysis all group separations and by far the larger number of individual separations are based on the precipitation of relatively insoluble compounds. Such precipitation reactions are always reversible and the extent which they proceed in one direction or the other depends on the conditions under which the precipitation is carried out. Consequently we find many cases in which the qualitative separations by precipitation are imperfect and others in which useful results can be obtained only by strict adherence to narrowly limited conditions. On the other hand reactions involving valence change as well as precipitation are very frequently of such a nature that broad conditions may be described under which they run to completion. For example, the silver ion will react with metallic copper to give

metallic silver and the copper ion and under the usual experimental conditions the precipitation of the silver is complete. Wherever such reactions can be used in qualitative analysis we may expect a sharp and unambiguous separation to a large measure independent of the experimental conditions.

With this thought in view the action of a number of reducing agents on acid solutions of metallic salts were investigated. Hydroxylamine, hydrazine and hydrosulphurous acid were soon found to have only limited applicability phosphorous and hypophosphorous acids gave more promising results; it was finally found that red phosphorus in a large number of cases would react smoothly and completely as a reducing agent in acid solutions.

The investigation conducted is by no means complete. Altogether about 120 experiments were performed which are not described in detail but in the following summary:

1. The reactions between red phosphorus and acid solutions of various salts have been studied and their application to qualitative analysis has been indicated.

2. The following ions are reduced by red phosphorus as follows: To insoluble phosphides; silver, gold, selenic, cupric, palladium and osmium. The last three being sometimes reduced to the metal. To the metal: Mercuric and mercurous as well as the three cited above. Other changes: stannic to stannous, ferric to ferrous, telluric to tellurous, MoO_4^{--} to Mo^{++++}, VO_3^{-} to V^{+++}, $Cr_2O_7^{--}$ to Cr^{+++} and MnO_4^{--} to Mn^{++}.

3. Bismuth, lead, cadmium, antimony, arsenic, stannous and AsO_4^{---} ions are not reduced by red phosphorus.

TeO_4^{--} and Pt Cl_6^{--} ions are reduced very slowly.—J. Am. Chem. Soc., 42 (1920), 883. (J. L. M.)

Sodium Phosphates.—*Action on Methyl and Ethyl Sulphates.*—O. Bailly has obtained the following results:

I. Neutral methyl sulphate acting upon tri-sodic phosphate gives a mixture of $PO(ONa)_2(OCH_3)$ and $PO(ONa)(OCH_3)_2$.

II. Neutral ethyl sulphate acts upon tri-sodic phosphate similarly, producing a mixture of monoethyl and diethyl sodium phosphate.

III. Neutral methyl sulphate acts similarly upon di-sodic phosphate, producing monomethyl and diethyl sodium phosphate.

IV. Neither methyl sulphate nor ethyl sulphate react in aqueous solution with mono-sodic phosphate nor with phosphoric acid.—J. pharm. chim., *22* (1920), 248.

Hypophosphites.—*Lack of Therapeutic Value.*—A research conducted by the Council of Pharmacy and Chemistry shows: There is no reliable evidence that they exert a physiologic effect. It has not been demonstrated that they influence any pathologic process. They are not foods. If they are of any use, that use has not been discovered. The hypophosphites were introduced into medicine by Churchhill, who advanced the theory, long since discarded, that the so-called tuberculosis diathesis was due to a phosphorus deficiency. It is now known that little phosphorus, if any, is assimilated from hypophosphites—far less than from phosphorus compounds of ordinary foods. As a result of the power of advertising, many physicians still prescribe hypophosphite combinations.—J. Am. Med. Assoc., 74 (1920), 1661. (W. A. P.)

Phosphoric Acid.—*Assay of.*—Kleinmann and Feigl report as follows:

Estimation as magnesium ammonium phosphate and effect of serum constituents on the precipitation.—Serum constituents, *e. g.*, dihydrogen potassium phosphate, urea, glycine, and calcium carbonate do not influence the precipitation of phosphoric acid as magnesium ammonium phosphate. The presence of sodium chloride in certain concentrations, however, leads to high results. Reagents employed in the precipitation of proteins, *e. g.*, picric acid and trichloroacetic acid, influence the precipitation, although they do not hinder it. Serum does not contain any substances which are capable of preventing the complete precipitation of phosphoric acid as magnesium ammonium phosphate. On precipitating 1 mg. P_2O_5 as magnesium ammonium phosphate in a volume of solution of 50—75 mils 0.006 mg. remains unprecipitated. With a smaller quantity, e. g., 0.1 mg. P_2O_5, the unprecipitated fraction is even proportionately higher. *Estimation as phosphoric acid-molybdenum complex.*—The uranium acetate method yielded good results with quantities as low as 10 mg. P_2O_5. Quantities below 10 mg. gave

unreliable results. With Liebermann's silver phosphate method high results were obtained, while the estimation of phosphoric acid as the vanadium-phosphoric acid-molybdenum complex was found satisfactory. *Estimation as phosphoric acid-molybdenum complex. Gravimetric and colorimetric methods.*—The precipitation of molybdenum by Raper's method gave too high values. The most suitable results were obtained with potassium ferrocyanide. 1 mg. of Mo was estimated in 100 mils with an error of 0.5 per cent. The procedure was therefore successfully applied for the colorimetric estimation of phosphoric acid. 0.1 mg. of P_2O_5 can be estimated by this method with a 0.5 per cent error. *Estimation in the phosphoric acid-moldybdenum complex. Volumetric and sedimetric methods.* Low results were obtained with Neumann's method for the estimation of phosphorus when the theoretical factor was used. By washing the phosphorus-ammonium-molybdate precipitate with 50 per cent alcohol instead of with water better results were obtained. In micro-Neumann estimations it is more satisfactory to wash the precipitate than centrifuge it, as a certain amount of loss is thus obviated. A "sedimetric" method is described by means of which the phosphorus is rapidly estimated by measuring the volume of the precipitate after centrifuging it in a graduated tube. The height of the phosphorus-ammonium-molybdate precipitate is proportional to its P_2O_5-content. *Estimation as a strychnine-phosphoric acid molybdenum compound. (Nephelometry.)*—The development of nephelometry and a new nephelometer and its manipulation are described. *Estimation as a strychnine-phosphoric acid molybdenum compound. Special phosphoric acid nephelometry and a new preparation of the strychnine-molybdenum-reagent.*—Strychnine and molybdenum for a compound suitable for use in estimation of phosphoric acid. 0.1—0.0005 mg. P_2O_5 can be estimated in this way nephelometrically with an error of 0.5 per cent.—Biochem. Zsch., through J. Soc. Chem. Ind., 39 (1920), 707A.

Phosphoric Acid.—*Volumetric Assay of.*—Neumann's method for determining phosphorus in organic substrata consists in destroying the organic matter by treatment with sulphuric and nitric acids, precipitating the phosphate thus formed as ammonium phosphomolybdate, and washing the precipitate with ice-cold water, which is passed through a filter. The latter, together with all the precipi-

tate, is then treated with rather more N/2 sodium hydroxide solution than is necessary to dissolve the precipitate, the ammonia thus liberated being boiled off and determined by titration: (mils of N/2 NaOH)$\times$0.5539 = amount of phosphorus in mg. Gregersen found it to be necessary to over-titrate with 0.5—1 mil of acid and to boil to expel carbon dioxide. Iversen's results show that this modification gives good results provided that the excess of N/2 alkali taken is at most 4 mils, and is subject to no systematic error; the mean value of the factor is found, from 25 analyses, to be 0.5526.—Biochem. Zsch., through J. Soc. Chem. Ind., 39 (1920), 707A.

Calcium Acid Phosphate.—*Quality of.*—K. Löffl discusses the use of this compound (called by him, *calcium biphosphate*) as a baking powder constituent. He describes assay and tests for purity and reports on 10 samples he obtained from German sources.—Pharm. Ztg., 65 (1920), 607.

Phosphates and Arsenates.—*Color Test for.*—G. Denigés proceeds as follows: A reagent consisting of a mixture of equal volumes of concentrated sulphuric acid and a 10 per cent. solution of ammonium molybdate is employed. To the solution about to be tested, 3 to 10 drops of the reagent are added, and after agitation, it is followed by the addition of 1 or 2 drops of a recently prepared solution of stannous chloride. In presence of phosphates or arsenates the solution assumes a blue color. The presence of fluorides interferes with the reaction. If, however, boric acid be added, the interference is negatived. The presence of organic matter does not inhibit the reaction.—Compt. rend., 171 (1920), 802. (G. C. D.)

Pyrophosphoric Acid.—*The Third and Fourth Dissociation constants of.*—I. M. Kolthoff found as average value for the fourth dissociation constant of pyrophosphoric acid 3.6×10^{-9}, while for the third constant 7.6×10^{-7} was found. The author was also able to construct a neutralization curve of $Na_2H_2P_2O_7$ and $Na_4P_2O_7$. Sodium pyrophosphate can be estimated volumetrically by titration with acid in the presence of dimethyl yellow as indicator. Since the hydrolysis of sodium pyrophosphate is strongly lessened in the presence of sodium chloride, this property of the salt may be utilized for determining its purity.—Pharm. Weekbl., 57 (1920), 474. (H. E.)

BORON.

Boric Acid.—*Poisoning by.*—Forsyth reports a case of poisoning in an infant from milk containing boric acid. The acid, used as a preservative, was present to the amount of 5 grains to the pint, and the child had been talking one-and-a-half to two pints of the milk daily. With no other treatment than a new supply of fresh cow's milk the aggravation of the symptoms ceased, and within a couple of days the child began to get well, though it was some months before she was herself again. The symptoms never recurred. —Lancet, through Drug. Circ., 64 (1920), 21.

Lindet states that boric acid provokes a loss of weight in men and animals, especially a loss of fat; it hinders nitrogenous metabolism and interferes with the efficient utilization of food by inducing excessive peristalsis, and even diarrhea. Only about 85 per cent. is eliminated, chiefly through the kidneys, and as 15 per cent. is left behind there is danger of cumulative action, especially in persons whose kidneys are not sound. He considers that the use of boric acid as a preservative in foods should be absolutely forbidden.— Policlinico, through Pharm. J., 104 (1920), 46.

CARBON AND SILICON.

Carbon.—*A Study of a Decolorizing*—Joseph C. Bock calls attention to the fact that the use of finely divided carbon is universal. There are, however, comparatively few attempts recorded in the literature to use it for the removal of substances other than coloring matters.

The carbon used in the present investigation was vegetable carbon called "Norit."

Norit removes, from urine, ammonia, nitrogen, chlorides and glucose slightly; urea, total nitrogen and phosphates considerably; creatinine very largely and uric acid completely.

Absorption from solution by solids is specific and selective. This unfortunately means only that we are as yet ignorant of relations which undoubtedly do exist between the degree of absorption, on the one hand and the physical and chemical properties of absorbent and absorbed substance on the other. J. Am. Chem. Soc. (1920), 1564. (J. L. M.)

Charcoal.—*Adsorptive Power of Different Kinds of.*—The presence of salts in charcoal decreases its adsorptive power considerably and it is, therefore, not advisable to add salts to the wood or bones before charring. It is also necessary to expose the substance to be charred to a very high temperature in a muffle furnace or a similar appliance because by doing so high molecular substances, which remain in the coal when this is heated only over a gas burner, apparently are removed and the coal is rendered more porous. K. Scheringa finds that filter paper ignited in a porcelain crucible with an ordinary gas burner gives a coal 100 mgms. of which do not decolorize a mixture of 10 mils of water and 4 drops of a one per cent. methylene blue solution, while when the coal in the crucible is heated in a coal fire at a higher temperature it readily decolorizes the liquid.—Pharm. Weekbl., 57 (1920), 348. (H. E.)

D. van Oos subjected different kinds of charcoal to the following tests: 1.5 grammes of methylene blue were dissolved in one liter of water and various quantities of this solution were shaken with 200 mgms. of the different species of charcoal. It was found that this amount of cellulose-charcoal decolorized 40 mils of the solution, while 17.5 mils were decolorized by medicinal norit, 15 mils by technical norit, 2.5 mils by bone charcoal, 2.5 mils by animal charcoal and 0.1 mil by wood charcoal. When applying a one per cent. caramel solution the decolorizing power was in the following descending order: Animal charcoal, wood charcoal, bone charcoal, cellulose-charcoal, technical norit, ebonit, medicinal norit. When shaking 200 mgms. of coal for one-half hour with 50 mils of n/10 iodine solution it was found that cellulose charcoal absorbed 23.5 mils, ebonit 14.5 mils, technical norit 13.75 mils, medicinal norit 11.5 mils, animal charcoal 7.5 mils, wood charcoal 3 mils and bone charcoal 2 mils. One-half gramme of the coal was then shaken with 100 mils of a one per cent. solution of quinine hydrochloride, the mixture was allowed to stand for 24 hours and filtered. The unabsorbed quinine hydrochloride was estimated by titrating with volumetric alkali in the presence of phenolphthalein. Thus it was found that ebonit had absorbed 1.2 mils of the quinine solution. technical norit 1.2 mils, medicinal norit 1.05 mils, cellulose charcoal 1.05 mils, bone charcoal 0.2 mil, animal charcoal 0.1 mil and wood charcoal 0.05 mil.—Pharm Weekbl., 57 (1920), 693. (H. E.)

Animal Charcoal.—*Adsorptive Power of.*—Michaelis and Rona point out the need of caution in attempting to express the adsorptive power of animal charcoal. They find that it takes 50 grammes of talc or 12 grammes of kaolin to absorb the amount of methylene blue solution absorbed by one gramme of animal charcoal. On the other hand, one gramme of animal charcoal will absorb as much heptyl or octyl alcohol as do 500 grammes of talc or several kilos of kaolin.—Biochem. Zsch., through Pharm. Zent., 61 (1920), 456.

Wood Charcoal.—*Adsorptive Capacity of.*—Alwyn Pickles describes methods of activation of coconut charcoal and then reports on its adsorptive power as far as certain fluids (*e. g.,* alkaline halides) and one gas (NH_3) are concerned.—Chem. News., 120 (1920), 301.

Carbon Monoxide.—*Simple Method for Detecting.*—Carbon monoxide, when bubbled through a solution of palladium chloride produces a dark color due to the separation of metallic palladium. Desgrez and Labat have utilized this reaction during the war for detecting carbon monoxide, especially in the trenches. For this purpose they impregnated filter paper with a 1 per cent. palladium chloride solution and placed this into the suspected air. This test paper may also be used for detecting carbon monoxide in dwellings, but since hydrogen sulphide interferes with the reaction, this should first be removed in the regular way by means of lead acetate.—Compt. rend. Acad. Med., through Pharm. Weekbl., 57 (1920), 890. (H. E.)

Soap Sand.—*Burmese.*—In several parts of Burma is found a sand called "The stapya," containing a considerable amount of sodium sulphate, sodium carbonate, sodium chloride and saltpeter. It is used by the natives as a cleansing agent.—Chem. Ind., through Pharm. Zent., 61 (1920), 487.

Silicates.— *Use in Medicine.*—Sartory, Scheffler and Pellisier who have studied the use of silicates in therapeutics, reported the results at the last meeting of the Academy of Sciences, Paris. Intravenous injection of sodium silicate has hitherto been considered dangerous, but the authors, who experimented first on guinea-pigs and rabbits, and finally on the human subject, state that such injections—com-

mencing with a milligramme daily and finishing with 1 centigramme —are supported without ill-effect, either immediate or subsequent. The chemical is useful in arteriosclerous and cardiorenal cases. Arterial tension is reduced, blood viscosity is lowered (it sometimes increases, but always to fall to normal afterwards), dyspnea diminishes and general vitality improves.—Chem. & Drug., 93 (1920), 1629.

ALKALIES.

Potash.—*Alsatian Deposits of.*—Potash deposits exist around Mulhausen, also around Wittelsheim. They extend from the northeast of Mulhausen to the foot of the Vosges Mountains, the best potash being found at a depth varying from 400 to 600 meters. The deposits have been estimated to contain 300 million tons of potash. The potash veins exist in alternate layers of red and grey color. They are composed of a mixture of sylvine or potassium chloride and rock salt or sodium chloride, the mixture being known as sylvinite. The color of the red layers is caused by oxide of iron; these veins are richer in potash than the grey veins, which contain a larger amount of rock salt. The content of KCl varies from 20 per cent. to 60 per cent. The Alsatian salts are very pure, containing little magnesium salts which are injurious in agricultural work, consequently they need only a simple grinding, differing from the Stassfurt carnallites which must necessarily be purified. Two specimens of sylvinite gave 14 per cent. K_2O (22 per cent KCl) and 20 per cent K_2O (32 per cent KCl).—Bull. Soc. Ind. Rouen, through Chem. News, 121 (1920), 250.

Potash.—*German Deposits of.*—The potash deposits of Germany, which were discovered by the Prussian Government in 1843 at Stassfurt while boring for rock salt and which occur in upper layers of rock salt in the plains of northern Germany, have been estimated to occupy a volume of 10,790,000,000 cubic meters and to contain 20,000,000,000 metric tons of potash salts, corresponding to about 2,000,000,000 metric tons of potash (K_2O), a quantity sufficient to supply the world for two thousand years at the present rate of consumption. These beds, according to the United States Geological Survey, Department of the Interior, were first exploited

about 1860, and have furnished practically the entire world's supply of potash for many years.—J. Frank. Inst., 190 (1920), 121.

The Potash Industry.—F. Klein presents an interesting general paper on this subject. He states that the *"peri lithon"* of Theophrastus was a potassium compound. The paper gives considerable details about the Stassfurt mines.—D.-A. Apoth. Ztg., 41 (1920), 25 and 38.

Potassium.—*Perchlorate Assay of.*—R. L. Morris points out that when the process is properly carried out the results are highly accurate, the average error not exceeding 0.1 per cent on pure potassium salts, and there is an average error of +0.1 per cent. in the presence of much sodium. Attention is called to the fact that the wash fluid should not contain less than 97 per cent of alcohol after adding 0.2 per cent. $HClO_4$. Exact details of the method of carrying out the process are given with rules as to temperatures. Quartz dishes are recommended, and the necessity for the removal of sulphates is emphasized. The author states that when magnesium, calcium, iron or barium are present they do not interfere, but when barium is present barium sulphate will be found in traces during evaporation over a gas flame.—Chem. News, 120 (1920), 282.

Potassium.—*Sensitiveness of Various Tests.*—O. Lutz made tests of the sensitiveness of various reactions for potassium under the same conditions as to temperature (18°), time of contact (5 mins.), and volume of potassium chloride solution (5 mils); the figures give the minimum concentration of potassium, which could be detected:—Perchloric acid, 1:435; phosphomolybdic acid, 1:561; platinum chloride, 1:587; sodium borofluoride, 1:970; aniline silicohydrofluoride, 1:1022; sodium phosphotungstate, 1:2170; phosphotungstic acid, 1:2809; sodium cobaltinitrite, 1:25000; sodium-bismuth thiosulphate, 1:57000; sodium picrate, 1:840; sodium amino-β-naphtholsulphonate, 1:1022; sodium bitartrate, 1.1050. These results may be expressed in weight of potassium, *e. g.*, 1:435 would be 11×10^{-3} g. K per 5 mils.—Z. anal. Chem., through J. Soc. Chem. Ind., 39 (1920), 584 A.

Potassium Bromide.—*Detection of Chlorides in.*—The new supplement to the French Pharmacopœia gives the following method:

First prepare a solution consisting of 100 mils of water saturated with aniline, 20 mils of water saturated with orthotoluidine and 30 mils of glacial acetic acid. Of this mixture, 10 mils are employed. A solution of the salt to be tested is made by dissolving 10 parts of salt in 100 parts of water. To 5 mils of this solution are added 10 mils of a mixture of equal parts of sulphuric acid and water and 10 mils of a saturated aqueous solution of potassium permanganate. The mixture is not subjected to distillation, and the vapors collected in a test tube, immersed in cold water, and containing 10 mils of the solution above named. In case of a pure bromide a white precipitate, resulting from the action of bromine on the aniline, is noted. In the event that the salt contains a chloride, a blue coloration is at first noted, which later on turns to violet-red. This latter reaction must not manifest itself until after the lapse of 15 minutes.—Pharm. Ztg., 65, (1920), 260. (G. C. D.)

Potassium Ferricyanide.—*Electrolytic Preparation of.*—Brown, Henke and Miller found that the maximum yield obtainable in the electrolytic oxidation of potassium ferrocyanide in an undivided cell was 50 per cent. When a diaphragm was used with a current of 0.90 amp. caustic potash was found in both compartments of the cells and a current efficiency of about 98 per cent. was obtained. The presence of potassium hydroxide increased the current efficiency.—J. Phys. Chem., through J. Soc. Chem. Ind., 39 (1920), 446 A.

Sodium vs. Potassium.—The following reasons are adduced for preferring sodium salts to potassium salts in medicine:

(1) *Rational therapeutics.* Sodium compounds are as efficient as, in many instances better than the corresponding potassium compounds. Potassium is more toxic. (2) *National aid.* Accustom yourself to use sodium, an abundant natural product of the United States. The home of potassium is Germany, which, to its own commercial gain, popularized potassium drugs. (3) *Price.* Sodium salts are cheaper. Potassium is, relatively speaking, a foreign substance in the body. Potassium and sodium salts are prescribed mainly for the effects of the radicle they carry. It is illogical, therefore, to administer potassium acetate or potassium bromide when sodium acetate or sodium bromide can more readily be given. In spite of the smaller demand, sodium salts are on the whole cheaper than potassium salts and, should the medical profession prescribe

the sodium more generally, all of those that might be used in medicine would be less expensive than the corresponding potassium salt.—J. Am. Med. Assoc., 75 (1920), 192.

Sodium Iodide.—*Use as Goiter Preventative.*—The latest report on the prevention of goiter by administration of sodium iodide by Marine and Kimball indicates a striking difference between those girls not taking and those taking iodine. The difference is manifested both in the prevention of enlargement and in a decrease in the size of existing enlargements. Of 2,190 pupils taking 2 grammes of sodium iodide twice yearly, five have shown enlargement of the thyroid, while of 2,305 pupils not taking the prophylactic, 495 have shown enlargement of the thyroid. Of 1,182 pupils with thyroid enlargement at the first examination who took the prophylactic, 773 thyroids decreased in size, while of 1,048 pupils with thyroid enlargement at the first examination who did not take prophylactic, 140 thyroids decreased in size.—J. Am. Med. Assoc., 75 (1920), 674.

CALCIUM, STRONTIUM AND BARIUM.

Calcium.—*Assays of.*—George E. E'we, of Philadelphia, gives in more or less detail a comparison of ten different methods of estimation. He worked with what he terms "standard material," a practically white, doubly refractive calcite. The preparation of this for analysis consisted in reducing it to a fine powder, and drying to constant weight in a platinum dish over a flame which was not permitted to touch the dish. The dried calcite was free from caustic as shown by its failure to turn red litmus paper when one gramme was made into a paste with a little water and tested with litmus paper. The dried calcite was preserved in a glass stoppered weighing bottle.—Am. J. Pharm., 92 (1920), 401. (J. K. T.)

Calcium Oxide.—*Assay of.*—Little and Beisler proceed as follows: 1 gramme of the powdered lime is shaken in a 1,000 mil flask with 950 mils of hot water and after allowing the mixture to stand for some hours, water is added to the mark. After the liquid has become clear, 100 mils are taken off by means of a pipette,

acidulated with hydrochloric acid and boiled with 5 mils of bromine water. The solution is then rendered alkaline with ammonia water and after being heated to boiling, the calcium is precipitated with boiling ammonium oxalate solution. The liquid is then heated on a water bath for 20 minutes, the precipitate is collected on a filter, washed with boiling water and is then dissolved in sulphuric acid. Funnel and filter are washed with 30 mils of sulphuric acid (1-3) and then washed with hot water. The solution and wash water are heated at 80° and are titrated with volumetric potassium permanganate solution.

The total calcium oxide is estimated by heating 300 mgms. of the sample in a beaker of 200 mil contents with 10 mils of water, 15 mils of strong hydrochloric acid and 3 to 5 mils of strong nitric acid. The mixture is allowed to stand on a water bath for 20 minutes, and after the addition of 100 mils of water, it is boiled for several minutes, a small excess of ammonia water is added, and the calcium is precipitated as oxalate and treated as just given. The authors recommend calcium oxalate for the standardization of potassium permanganate and prepare this oxalate by dissolving pure calcium oxide in hydrochloric acid, neutralizing the solution with ammonia water, making the liquid slightly acid with acetic acid and precipitating the calcium in the boiling solution with ammonium oxalate. The precipitate is washed with boiling water and dried at 140° of constant weight.—J. Am. Leather Chem. Assoc., through Pharm. Weekbl., 57 (1920), 888 (H. E.)

Lime.—*Slaking of.*—B. Kosmann criticises the views of Kohlschütter and Walther holding that the slaking of lime consists in a gradual stepwise combination with water in which the following substances are produced in order: $Ca(OH)_2$, $HCa(OH)_3$, $H_2Ca(OH)_4$, $H_3Ca(OH)_5$, $H_4Ca(OH)_6$, $H_5Ca(OH)_7$, $H_6Ca(OH)_8$, and $H_7Ca(OH)_9$.—Z. Elektrochem., through J. Soc. Chem. Ind., 39 (1920), 446 A.

Calcium Salts.—*Intravenous Injections in Tuberculosis.*—H. Maendl recommends in tuberculosis the intravenous administration of calcium chloride. In pulmonary hemorrhages, he finds intravenous injections of 5 to 10 mils of 10 per cent. calcium chloride solution of much service.—Med. Klin., through Pharm. Ztg., 65 (1920), 503.

Calcium Salts.—*Pharmacological Action of.*—The result of a study of the effect of the administration of calcium salts by mouth to men, cats and rabbits, made by Denis and Minot indicates that in most cases it is impossible to increase the concentration of calcium in the plasma by ingestion of calcium salts, but that in cats and rabbits, in which the initial concentration is low, it is sometimes possible to greatly increase the amount of calcium in plasma by feeding salts of this element.—J. Biol. Chem., through Drug. Circ., 64 (1920), 339.

Calcium Carbonate.—*Assay and Tests for Purity.*—J. Prescher gives his personal experiences in using the general methods of determining strength and purity of calcium carbonate.—Pharm. Zent., 61 (1920), 453.

Calcium Carbonate.—*Iron Content.*—Of ten samples of precipitated chalk examined by K. F. Ehmann only two gave no trace of iron. The presence of iron in chalk that is used for the manufacture of tooth pastes will cause red spots to form in the paste and may also cause the paste to harden in the tube. Most of the commercial precipitated chalk contains iron.—Proc. Penna. Pharm. Assoc., 45 (1920), 256. (L. S.)

Calcium Carbonate.—*Use in Pharmacy and Medicine.*—A. B. Nichols gives an historical account of the sources and uses of the various forms of this chemical. As is well known, chalk is used extensively in the various industries. Medicinally, it has been used for ages as a mild astringent and because of its mechanical action as serving as a coating to the gastro-intestinal tract. In pharmacy it has served as a diluent in many preparations, principally in tooth powders.—Am. J. Pharm., 92 (1920), 391. (J. K. T.)

Calcium Chloride.—*Action in Glycosuria.*—The fact that an injection of chloride of calcium causes the disappearance of incipient glycosuria induced by the ions of sodium, and the antagonism that exists between the ions of sodium and the diatomic ions of calcium, has led M. Procas, of Athens, to administer calcium to certain diabetic patients. He gives preference to lime water, since its alkalinity may serve to neutralize acidity, the lime water proving

preferable to counteract the acidity of the sodium bicarbonate which saturates the organism with carbonic acid. From the experiences reported, the author decides on the excellent action of lime water to cause a diminution or disappearance of sugar in diabetic patients.—L'Union Pharm., through Pharm. Era, 53 (1920), 241.

Calcium Chloride.—*Technical Uses of.*—In machinery for making ice used in ice factories, meat packing houses, cold storage warehouses, chemical works, and oil refineries, brine is pumped through coils. A calcium chloride solution will withstand lower temperature without freezing than salt brine and has an advantage over the brine because it has no action on iron or brass, thus giving longer life to the pumps, coils and tanks. Calcium chloride costs more than salt, but less of it is required for a given amount of refrigeration.

A solution of calcium chloride in fire buckets has an advantage over water in that it does not corrode metal, has a lower freezing point, and does not become foul. Because of its affinity for water it tends to keep the buckets full by extracting moisture from the atmosphere. It has long been known that brine is much more effective than water in extinguishing a fire. This is due to the fact that when the brine is thrown on a fire the liquid evaporates and the salt is left as a protective coating on the burning surface. A solution of calcium chloride, therefore, whether in an automatic sprinkler or in a fire bucket, is especially valuable.—Pharm. Era, 53 (1920), 133.

Barium Salts.—*Danger in Use as Rat Exterminators.*—K. Kraft states that a certain German rat exterminator, containing barium carbonate, was labelled "free from poison." He points out that barium carbonate when introduced into the stomach becomes the readily absorbed poison, barium chloride.—Z. angew. Chem., through Pharm. Zent., 61 (1920), 297.

Barium Sulphide.—*Toxicity of.*—F. W. E. Steden discusses the toxicity of barium sulphide based on an examination of the medical pharmaceutical literature and experiments with guinea pigs. He also states that he has taken sixty-one grains of barium sulphide and suffered no particular inconvenience. Mr. Stedem concludes

that barium sulphide is rather less toxic than people have been led to believe. He proposes to continue his investigations.—Bull. Pharm., 34 (1920), 40. (C. M. S.)

Barium Sulphate.—*Use in Radiology.*—An editorial comments upon the death of a judge in Minneapolis through the administration of the poison barium *sulphide* instead of barium *sulphate* called for in the prescription. The editorial points out the number of fatalities resulting from this confusion of names and then discusses the use of barium sulphate in radiology, giving the following recipe from the British Pharmaceutical Codes for a mixture to be used in administering the sulphate:

Barium sulphate	150 grammes
Corn flour	15 grammes
Sugar	15 grammes
Cocoa	20 grammes
Water	500 mils

The editorial recommends the introduction of barium sulphate in U. S. P.—N. W. Drug., 28 (1920), 368.

Calcium, Strontium and Barium.—*Microchemical Reaction with Iodic Acid.*—G. Denigés finds that iodic acid gives with both soluble and insoluble salts of calcium, strontium and barium, well characterized crystalline precipitates that can be identified by means of the microscope.—Compt. rend., through J. pharm. chem., 22 (1920), 197.

Calcium, Strontium, Barium and Magnesium.—*Separation of.*—I. M. Kolthoff recommends precipitating the metals of the calcium group and magnesium by heating the solution with sodium carbonate and a caustic alkali, having found that better results are obtained by using this chemical than by using ammonium carbonate as a precipitant. The caustic alkali is added in order to set free the ammonia from the ammonium salts, since free ammonia was found to be less disturbing in the precipitation than the ammonia present as ions. In the precipitate calcium, barium and strontium are estimated by the chromate method and in the filtrate from the chromates the magnesium is precipitated as ammonium-magnesium phosphate.

Kolthoff, therefore, recommends sodium carbonate as reagent for group VI.—Pharm. Weekbl., 57 (1920), 1229. H. E.)

Barium, Strontium and Calcium.—*Separation by the Dichromate Method.*—I. M. Kolthoff dissolves the salt mixture as carbonates in acetic acid and boils off the carbon dioxide. He then adds enough sodium acetate to make the molar concentration of it and of the acetic acid approximately equal. He then precipitates the barium with potassium dichromate, filters after five minutes, makes the filtrate faintly alkaline with ammonia, adds an equal volume of 96 per cent. alcohol, lets fluid stand for 30 minutes and then filters. The precipitate will contain the strontium which can be detected by the flame test, while the filtrate contains the calcium, which can be tested with ammonium oxalate. If the first part of the manipulation is not carefully carried out the precipitate produced by adding alcohol may contain barium or even calcium. When carefully conducted the test will detect 1 milligramme of a given alkaline earth element in 100 milligrammes of a mixture of the other two.—Pharm. Weekbl., through Chem. Abstracts, 14 (1920), 3381.

Barium and Strontium.—*Volumetric Assay of.*—I. M. Kolthoff estimates barium by adding to the solution a small amount of sodium acetate and an excess of volumetric potassium dichromate solution, allowing the mixture to stand for three hours, filtering and estimating in the filtrate the excess of potassium dichromate iodometrically. The determination can be carried out in the presence of calcium which does not interfere with the titration. If strontium is present the barium should be precipitated in the presence of acetic acid. Strontium is determined by adding to the solution an excess of volumetric potassium bichromate solution, then ammonia water until a faint yellow color is produced and finally sufficient alcohol to obtain a liquid containing 50 per cent. of alcohol. The mixture is allowed to stand for 24 hours, filtered and in the filtrate the excess of dichromate is estimated iodometrically. Ammonium acetate interferes with the estimation and strontium cannot, therefore, be estimated in the presence of barium, or when this has been estimated by precipitation in the presence of acetic acid. Large amounts of calcium also interfere with the estimation.—Pharm. Weekbl., 57 (1920), 972. (H. E.)

RADIO ACTIVE ELEMENTS.

Radioactive Bricks.—*Medicating Water with.*—H. J. Knollmann describes these bricks which are made from Albany slip clay, a rather plastic clay, and some infusorial earth. Any clay or mixture with a low amount of soluble salts and maturing to a hard body at about cone 80 may be used. A precipitate of mixed radium sulphate and barium sulphate is added. During burning, oxidizing conditions must be maintained, or the radium sulphate will be reduced to sulphite, which, being soluble, would subsequently be lost. These bricks or plates are immersed in water, which is to be drunk by the patient.—J. Am. Ceram. Soc., through Pharm. J., 104 (1920), 28.

Protoactinium.—*A New Radio-active Element.*—Hahn and Meisner claim to have isolated from the pitch blend residue that is insoluble in nitric acid, a new radio-active element, which they believe is the parent of actinium.—Chem. Ztg., through Pharm. Zent., 61 (1920), 58.

Uranium Salts.—*Action on the Blood.*—Mas Magro's research on the action of uranium on the blood-producing organs show that a subcutaneous intraperitoneal injection of a two per cent. solution of uranium acetate in rabbits and guinea-pigs caused an epithelial nephritis with death the sixth or seventh day. This is the effect of the minimal lethal dose. When death occurs in three hours and a half, the blood shows coagulation, thrombosis, precipitation and agglutination. Uranium thus does not induce death directly.—Am. J. Pharm., 92 (1920), 138. (J. K. T.)

SILVER.

Protein Silver.—*Commercial Varieties.*—Kroeber reports that commercial samples examined contain the full amount of silver but are questionable as to their organic combinations. He recommends the introduction into the German Pharmacopœia of the following requirements:

(1) Determination of silver by the Marschner-Rupp method, using the original, not pre-dried substance, requiring a minimum of 7.78 per cent. of silver.

(2) The loss by drying not to exceed 3 per cent.

(3) A test for the absence of ammonia.

(4) Clear solution in water.

(5) Identity tests: To 5 mils of a 2 per cent. solution add hydrochloric acid drop by drop until precipitation occurs. The precipitate redissolves upon the addition of 15 mils of 25 per cent. hydrochloric acid in cold solution.

Shake 1.0 gramme of silver compound with 10 mils of absolute alcohol for three minutes and filter. The filtrate (about 7 mils) upon dilution with hydrochloric acid up to 10 mils must not turn turbid. This method detects 0.1 to 0.2 per cent. of ionic silver salt.—Schweiz. Apoth. Ztg., 58 (1920), 597. (H. A. L.)

GOLD.

Gold.—*Adsorption from Colloidal Solutions by Fungi.*—M. Williams noticed that *Penicillium glaucum and Oidium lactis* grow in colloidal gold solutions, especially when these contain tannic acid or acacia. The fungi abstract the gold from the solution and deposit it in the cuticularisized cell-walls and thereby become colored blue.—Ann Bot., through Pharm. Weekbl., 57 (1920), 351. (H. E.)

Gold Amalgam.—*Colloidal.*—Paal and Steyer find that when colloidal gold preparations are treated with mercury in a hydrogen atmosphere a colloidal gold amalgam is produced. Acids coagulate the amalgam, while the cautious addition of diluted alkali makes a more or less stable preparation.—Kolloid. Zsch., through Pharm. Zent., 61 (1920), 253.

Colloidal Gold Reaction.—*Clinical Importance of.*—Eicke finds that the main trouble with this reaction is the preparation of the colloidal gold. The trouble lies in the extreme sensitiveness of colloidal gold to chemical influences; even the alkalinity of the glass may give the solution a bluish tinge and render it useless from the start. Another frequent cause of failure is that fresh, doubly distilled water is not used. The colloidal gold reaction furnishes an interesting proof of the baneful effects of exceedingly slight impurities in water. The main value of the colloidal gold reaction is that it gives us a means for the early diagnosis of neuro-syphilis. At the Virchow Hospital in Berlin, it has established the syphilitic

origin in many obscure cases. In one of optic neuritis, the etiology was baffling. The personal and family history was negative. The Wasserman test was also negative, but the colloidal gold reaction gave the typical curve of cerebrospinal syphilis. The patient, who was seriously ill, was at once given specific treatment with good results. If it should prove possible to simplify the preparation of the colloidal gold, this reaction might be regarded as ideal and would be of the greatest value in medicine.—Am. J. Pharm., 92 (1920), 139. (J. K. T.)

MAGNESIUM.

Magnesium.—*Detection of.*—F. Eisenlohr treats five mils of a solution of alkannin in alcohol (96 per cent.) with one drop of *2N* ammonium carbonate solution, which does not cause any change in color, and then with a drop of neutral salt solution to be tested; the presence of magnesium, strontium, or manganese is denoted by the development of a bluish-violet coloration, which becomes pale red after acidification with one or at most two drops of *2N* hydrochloric acid; subsequent addition of the same number of drops *2N* ammonium carbonate solution restores the bluish-violet color only if magnesium is present. If the test is to be applied to suspected magnesium ammonium phosphate, the salt is dissolved in *2N* hydrochloric acid and a drop of this solution is added to the alkannin solution; further addition of 1 to 2 drops of ammonium carbonate causes the appearance of the bluish-violet color if magnesium is actually present, whilst otherwise the original color of the tincture is restored. It is essential that the alcoholic solution should not become diluted with water, since in this case a blue coloration is invariably produced which is due to ammonia formed by hydrolysis of the ammonium carbonate.—Ber., through J. Soc. Chem. Ind., 39 (1920), 767 A.

Magnesium.—*Uses for.*—The lightest metal now known that remains comparatively unaltered under ordinary atmospheric conditions is magnesium, which is only two-thirds as heavy as aluminum. Magnesium is a beautiful silvery-white metal that has been made in the United States only since 1915 and is now made at three plants. It is known chiefly as a silvery powder used for making flashlights in photography. It was imported from Germany for this use for many years. During the world war large quantities of

powdered magnesium were made in the United States for use in star shells designed to illuminate battlefields at night, as well as in special shells designed to show in the daytime exactly where the shells containing it exploded. The white cloud by day and the brilliant white pillar of fire by night—both striking features of the battlefields of the world war—were produced by the combustion of magnesium.

Magnesium in massive form, as sticks or rods, is used to deoxidize other metals in foundries and is a constituent of alloys. More magnesium is now used as a deoxidizer or scavenger in metallurgy than for any other purpose, but its employment in alloys is increasing and may eventually become the largest one. An alloy of magnesium and aluminum is used in making castings for aircraft engines and parts of airplanes. The skeleton of the British airship R-34, the first dirigible to cross the Atlantic, is an alloy of aluminum and magnesium, and the yacht Resolute, the defender of the America's cup in the races in July, 1920, as well as the alternative defender, Vanitie, carried gaffs made of this alloy.

The demand for metallic magnesium has slackened since the war, however, and in 1919 its production in the United States amounted to 127,465 pounds, valued at $247,302, a decrease of 55 per cent. in quantity and 60 per cent. in value from 1918.—Bull. U. S. Geolog. Survey., through Pharm. Era, 53 (1920), 368.

Magnesia.—*Use as Fertilizer.*—A. Filber calls attention to the fact that the value of magnesia as fertilizer is too little known. That magnesia is necessary for the growth of plants is shown by the fact that the seeds contain more magnesium oxide than calcium oxide, and further by the splendid results obtained in Holland with a fertilizer named "patentkali" which is a potassium-magnesium sulphate. Potatoes grown on a soil to which magnesium oxide in addition to potassium has been added, were richer in starch than those grown in soil which contained no additional magnesium oxide. —Ernährung der Pflanze through Pharm. Weekbl., 57 (1920), 776. (H. E.)

Magnesium Hydroxide.—*Notes on the Precipitation of.*—Terry and Davy give some valuable notes on the chemistry of this process as involved in the manufacture of "milk of magnesia" from magnesium sulphate and sodium hydroxide. About fifty samples were

prepared and these are put into six groups. With five groups, the magnesium sulphate solution was poured into the sodium hydroxide solution; one had the N. F. concentration; one had both solutions in double concentration; one had double dilutions of both solutions; one had only the magnesium sulphate in double concentration; and one had only the sodium hydroxide in double concentration. The sixth group had both solutions of N. F. concentration, the hydroxide solution being poured into the sulphate solution. Samples were made with theoretical proportions and with 10, 25 and 50 per cent. excess of each ingredient and the temperatures used were 25°, 50° and 100°. All these are arranged in tables to show precipitation "values." Solutions of N. F. concentration (sulphate added to hydroxide) show that the greater the excess of sulphate, the more gelatinous the precipitate. Temperature has little effect when hydroxide is in excess but theoretical proportion or excess of sulphate cause increase of gelatinization with rising temperature. In general concentrating the solutions decrease gelatinization. In every case double dilution of both solutions increases gelatinization. In general the more rapidly solutions are mixed the better the magma.

A table is given to show the absorption of magnesium sulphate by the magnesium hydroxide. Where there is an excess of alkali all the sulphate is precipitated, hence none is absorbed and the supernatant liquid requires nearly the theoretical amount of standard acid for neutralization. The tables are well worth very close study. —J. Am. Pharm. Assoc., 9 (1920), 148. (Z. M. C.)

Magnesium Sulphate.—*Use as a Sedative in Chorea.*—Cavalieri has successfully given hypodermic injections of magnesium sulphate to calm the exhausting muscular contortion of grave cases of chorea, in which the sleep and feeding of the patients were interfered with by the incessant violent movements. Excellent sedative results followed the administration of 2 mils of a 1:4 solution, the injection being repeated twice or thrice in twenty-four hours. No necrosis of the tissues was observed with this strength of the solution, nor did it give rise to any pain locally.—Rivista crit. Clin. Med., through Pharm. J., 104 (1920), 40.

Magnesium Sulphate.—*Use in Inflamed and Suppurating Lesions.*—J. Alston has found a 1 : 40 or 1 : 20 solution of magnesium sulphate applied warm, as a compress on saturated lint, a

most satisfactory dressing for carbuncles and other septic lesions, and is also an efficacious dressing for erysipelas. The solution should be sterilized by boiling and cooled before use. Applied to wounds, it promotes a flow of serum, which acts as a natural disinfectant and stimulates healthy granulations. A number of cases of various forms of infected lesions are quoted in which magnesium sulphate dressing has proved most successful. This simple method of treatment is considered to be most useful to the general practitioner.—Med. Press, through Pharm. J., 104 (1920), 545.

Epsom Salt.—*Large Deposit Discovered.*—A deposit of more than twenty million tons of magnesium sulphate has been discovered at Basque, British Columbia. Samples from the surface area show a purity of 99.5 per cent.—Bull. Pharm., 34 (1920), 135. (C. M. S.)

Epsom Salt.—*Tasteless.*—R. R. Foran reports that a preparation sold under this title as a nostrum not any better than Magnesium Sulphate U. S. P. for which the official requirement is 99.5% of crystallized magnesium sulphate. Furthermore the product is not tasteless although the taste of this preparation as well as the official substance is disguised somewhat when taken according to the directions—in ice cold water.—Proc. Penna. Phar. Assoc., 45 (1920), 151. (L. S.)

Talc.—*Sources and Uses.*—R. B. Ladoo reports that the uses for talc are many, but, until recently the talc sources in this country have been neglected. America produces 65 per cent. of the world's talc and Germany and Austria only 5.4 per cent., yet in the Proceedings of the Austro-Hungarian Talc Association for the years 1912 and 1913, many notes upon new uses appeared, together with suggestions as to further development of old uses, while aside from a few notes on the use of talc in paper, little has been published in the English language upon this subject.

In New York talc mining was started about 1876, but important production did not start until 1880, when about 4,000 tons were shipped. In 1883 the production was about 6,000 tons, valued at $75,000, or an average of $12.50 per ton. From that date the production gradually increased to a peak of 93,236 tons in 1916, valued at $961,510 or about $10.30 per ton. In 1918 the production de-

clined to 71,167 tons, valued at $902,100, or about $12.70 per ton. For many years New York was the largest producer in the United States, but in 1917 and 1918 its output was surpassed by Vermont in tonnage, though not in value. In June, 1920, there were three companies producing talc in the Gouverneur district, St. Lawrence County, and one near Natural Bridge.

The Gouverneur talc district consists of a narrow belt, lying to the southeast and east of that village in the town of Fowler and Edwards, in which the talc occurs in lenticular bodies arranged in series along the strike. The bodies dip uniformly toward the northwest at angles of from 30 degrees to 60 degrees, so that they are all worked by underground methods. The fibrous talc is an alteration product of tremolite, which it resembles in physical development, but the scaly talc apparently is the result of decomposition by underground waters. Altogether there are fully fifteen or twenty different deposits, some of which, however, are not profitable under present conditions, while others are being held in reserve. The number of operative mines in recent years has ranged from five to eight or nine.

A deposit of talc near Natural Bridge has been worked for the last four years, and has supplied a considerable quantity of material, which is sold in ground form. This deposit occurs in limestones, but in a separate area from the Gouverneur belt and has a quite different character. The talc lacks any definite structure, except that it shows a granular appearance in places, and is associated with other hydrated silicates of the serpentine and chlorite groups. It appears to be a contact deposit, lying near an intrusion of granite.—Drug. Circ., 64 (1920), 370 and 462.

ZINC AND CADMIUM.

Zinc.—*Assay as Zinc-Ammonium Phosphate.*—P. Artmann precipitates the zinc salt as zinc ammonium phosphate and then determines the ammonia iodometrically. Note must be taken of the fact that 100 grammes of water dissolves 0.00145 gramme of $ZnNH_4PO_4$. By this method, Artmann determined the zinc in an alloy containing 1 part of zinc and 200 parts of copper.—*Z.* anal. Chem., through Pharm. Zent., 61 (1920), 152.

Zinc.—*Assay in the Cadaver.*—S. Giaya presents the results of his study of this subject covering his experience in the zinc assay

of various parts of 14 cadavers ranging from a fetus to a man of 70 years. In some experiments he destroyed the organic matter by the Ogier potassium chlorate, hydrochloric acid method and in other cases he accomplished the same purpose by treating the tissues with a mixture of nitric and sulphuric acid. The resultant fluid was freed from excess acid by evaporation after which the zinc was precipitated as zinc sulphide, the precipitation being repeated under various conditions until a pure zinc sulphide was obtained and the zinc content of this was then determined by the ferrocyanide titration method.

His assays showed that the normal zinc content of the mixed viscera varied from 10 to 50 milligrammes per kilo; that bones contained no traces of zinc; that normal urine contained 0.00017 grammes of zinc per liter; and that human milk contained 0.0013 gramme per liter.

The articles contains two tables in which his analytical findings are given in detail.—J. Pharm. Chim., *22* (1920), 85.

Zinc.—*New Volumetric Assay of.*—J. Houben finds that a colloidal solution of iron sulphide is as good an indicator for acids and for alkalies as methyl orange and phenolphthalein. The solution he prepares by running hydrogen sulphide into a solution of iron and ammonium sulphate until a permanent black fluid is obtained.

His assay of zinc salts consists in completely precipitating the metal with hydrogen sulphide, then adding the iron sulphide indicator and then titrating the acid liberated from the zinc salt with a volumetric solution of sodium borate. — Ber., through J. pharm. chim., 21 (1920), 359.

Zinc.—*Occurrence in Foods.*—V. Birckner, employing the Breyer assay for small amounts of zinc, finds that a hen's egg contains about 1 milligramme of metal (almost entirely in the yoke); that milk contains about 4.2 milligrammes per kilo; and that mother's milk contains a distinctly larger quantity of zinc than does cow's milk.—J. Biol. Chem., through J. pharm. chim., 21 (1920), 39.

Zinc.—*Occurrence in Oysters.*—Hiltner and Wichmann find zinc present in all oysters living in the Atlantic, the zinc content not always being in ratio with the zinc content of the water wherein

they lived. It seems probable that the oyster has a certain absorption capacity for zinc salts.—J. Biol Chem., through J. pharm., chim., 21 (1920), 39.

Cadmium.—*Pharmacological Action of.*—Alsberg and Schwartze find that cadmium chloride is a powerful emetic. Parenteral administration of it produces nephritis, and coagulation of protein and necrosis occur at the site of subcutaneous injections. The lethal dose for cats, rabbits and rats is low, two to three and a half milligrammes of the chloride causing death.—Am. J. Pharm., 92 (1920), 139. (J. K. T.)

MERCURY.

Mercury.—*Assay of.*—H. B. Gordon reports that mercury in very dilute solution may be determined by depositing it on copper gauze, then heating the copper in hydrogen and noting the loss in weight due to the volatilization of the mercury. The volatilized mercury may be converted into mercuric iodide by the action of iodine vapor. As little as 0.1 mgrm. of mercury in 2 liters of solution may be detected and determined. The presence of nitrates does not interfere; arsenic, bismuth, antimony and silver interfere to some extent, but it is probable that by heating the copper gauze carefully to avoid volatilizing these elements with the mercury the method might be used in their presence.—Analyst., through J. Soc. Chem. Ind., 39 (1920), 250 A.

Mercury.—*Preparation of Colloidal.*—Gutbier and Weise pass a current of electricity (3 to 4 amperes, 110 to 220 volts) through water, from an anode of pure mercury to a cathode of thin sheet platinum. The grayish fluid thus obtained is not stable but the addition of from 2 to 10 per cent. of acacia stabilizes them for at least 10 to 14 days.—Kolloid. Zsch., through J. pharm. chim., 20 (1920), 392.

I. Nordlund by shaking mercury with aqueous solutions of potassium citrate ($2—7\times10^{-3}N$), produced strong, very stable sols of a reddish brown-grey color. Various other methods tried yielded sols of low stability.—Koll. Zsch., through J. Soc. Chem. Ind., 39 (1920), 412A.

Mercury.—*Colorimetric Test for.*—When a solution or suspension of a mercury compound is treated with one drop of nitric

acid and an excess of ferrous sulphate solution and the mixture underlaid with concentrated sulphuric acid, a violet ring is formed at once at the zone of contact of the liquids, while the brown ring produced by the action of the nitric acid on the ferrous sulphate develops later above the violet ring. Abelmann found that by this method the metal can be detected in minute quantities.—Pharm. Zent., through Drug. Circ., 64 (1920), 63.

Mercury.—*Production in the United States in 1918.*—In 1918 the production of mercury in the United States was 32,883 flasks (of 75 lb.), valued at £772,750. The total number of producing mines was 47, the total exports 3098 flasks, and the total imports 6719 flasks.—J. Soc. Chem. Ind., 39 (1920), 168R.

Mercury.—*Injections of the Element and Its Salts.*—Cole, Littman and Sollmann report that the administration of mercury by intramuscular injection, if properly and carefully used is cleanly and efficient. The most important objection to this method is uncertain, uneven and delayed absorption of the mercury, especially when insoluble preparations are being used. The authors have studied the rate of absorption of different mercury preparations administered intramuscularly by means of the Roentgen-Ray. They report that the absorption can be followed admirably by Roentgen-Ray shadows, but the method is not applicable to soluble preparations. They find that mercurial (gray) oil injections are both inefficient and dangerous, because of slow absorption. Calomel injections are also dangerous. Mercuric salicylate injections, particularly into the gluteal muscle, give a satisfactory absorption and present relatively little danger.—J. Am. Med. Assoc., 75 (1920), 1550. (W. A. P.)

Mercury.—*Volumetric Assays of.*—Low gives the following method for estimating mercury volumetrically. The mercury is precipitated as sulphide, and the precipitate boiled with sulphuric acid and potassium permanganate until fumes of sulphuric acid are evolved. While still hot oxalic acid is added to the mixture to dissolve the manganese dioxide and the heating is continued until the excess of oxalic acid is destroyed. After cooling, the liquid is diluted with water and the mercury is titrated with volumetric ammonium thiocyanate solution and ferric alum as indicator

in the presence of nitric acid in the usual way.—Chem. Analyst., through Drug. Circ., 64 (1920), 218.

Mercury with Chalk.—*Quick Preparation of.*—A communication by Peter Boa was presented before the Pharmaceutical Society of Great Britain, and was discussed by several members of the association.

In brief the process consists of hastening the "extinction" of the mercury by the aid of ether.—Pharm. J., 104 (1920), 200. (L. N. B.)

In connection with the foregoing, it should be said that D. B. Dott finds that pure ether has no action on mercury, while ether, which indicates peroxide, invariably reacts, causing formation of a dark-colored film, and resulting in the formation of minute globules mixed with a grey powder, when the metal and ether are shaken together. When ether containing much peroxide (the so-called ozonic ether) is employed, not only is the grey powder formed, but also a certain amount of yellow mercuric oxide. There can be little doubt that the value of ether in aiding the complete mixing of the mercury with the chalk in making "grey powder" is due to the presence of an oxidizing impurity in the ether usually employed, and it would obviously be very inadvisable to indefinitely increase the proportion of oxide by the use of ether containing an unknown percentage of peroxide.—Brit. Col. Drug., through Pharm. Era, 53 (1920), 168.

Mercury Compounds.—*Microchemical Detection of.*—Denigés reports that characteristic crystals are formed when a small quantity of a mercury compound or salt is treated on a microscope slide with a drop of potassium iodide-bromide solution. Mercurous compounds and mercuric cyanide are treated previously with bromine-water. In the case of mercuric iodide, the crystals obtained on evaporating its alcohol or acetone solution serve for the identification.—Bull. Soc. Pharm. Bordeaux, through J. Soc. Chem. Ind., 39 (1920), 107A.

Calomel Ointment.—*Use by Inunction.*—Mercurial inunction has been successfully employed since the earliest times for the treatment of syphilis, always in the form of mercurial ointment. Recently it has been suggested that calomel should be used, instead of

metallic mercury, for this purpose. Calomel thus employed is undoubtedly more cleanly, and leaves less obvious traces of its use. Cole and Littman find, however, as the result of observations on a series of fifty-four cases, that it is not efficacious. They conclude that calomel inunctions are almost totally inefficient against primary and secondary syphilis. They very rarely produce salivation or gingivitis. This indicates poor absorption and explains the clinical inefficiency. Contrary to the claims made for it, calomel may occasionally cause dermatitis. These results have led the authors to abandon the use of calomel for mercurial inunctions, and they strongly advise against their further use in the treatment of syphilis. —J. Am. Med. Assoc., through Pharm. J., 104 (1920), 46.

"Protoiodide of Mercury."—Recently quite a number of inquiries have been received by J. R. Hill, from different quarters as to what precisely is intended by the prescriber in the following prescription:

Hydrarg. protoiodid. .....gr. ¾
Pulv. opii. .....gr. ½

The answer given was "Hydrarg. iodid vir. of the 1867 B. P." It seemed open to doubt, however, whether this was quite correct, and the more so that American and Canadian prescriptions have become increasingly common in this country in recent years. It was found on inquiry that most of the prescriptions emanated from the venereal clinic attached to a large general hospital. The prescriber said he had in mind the Protoiodure de Mercure of the French Codex, which is made by triturating metallic mercury with iodine in presence of alcohol, the proportion of mercury to iodine being higher than in the B. P. 1867. The answer given was therefore correct. In Martindale's Extra Pharmacopœia protoiodide of mercury is given as a synonym for green iodide of mercury of the 1867 B. P. and it is the custom of British wholesale houses to supply green mercurous iodide when protoiodide of mercury is ordered.—Chem. & Drug., 92 (1920), 421.

Mercuric Salts.—*Precipitation with Hydrogen Sulphide.*—Studying the well-known fact that when hydrogen sulphide is passed into diluted mercuric solution the precipitate gives through a range of colors from white to black. Jolibois and Bouvier find that the

only substances precipitated are $2HgS.HgCl_2$ and HgS and that the various colors are due to the various proportions of these found in the precipitates.—Compt. rend., through J. pharm. chim., 21 (1920), 360.

Mercuric Chloride.—*Assay of.*—J. M. Kolthoff and J. Kaijzer report that by assaying mercuric chloride with formaldehyde inaccurate results are obtained and they, therefore, replace formaldehyde by hydrogen dioxide solution and proceed as follows: 25 mils of n/10 mercuric chloride solution is mixed with 10 mils of 4/n caustic soda solution and 5 mils of hydrogen dioxide solution, the mixture is heated in a glass stoppered Erlenmeyer flask for 15 minutes in a boiling water bath with frequent shaking, then 15 mils of 4/n sulphuric acid is added and the mixture is allowed to cool. After the addition of 40 mils of n/10 iodine solution the flask is shaken for about one-half hour until all the mercury is dissolved and then the excess of iodine solution is titrated back with sodium thiosulphate solution. It is claimed that in this method no calomel is formed.

Still more rapidly the mercuric chloride can be assayed acidimetrically according to Rupp's investigations, that concentrated mercuric chloride can be directly titrated with phenolphthalein as indicator in the presence of n/2 potassium cyanide solution. This titration cannot well be applied in the presence of large amounts of chlorides. The process is carried out by adding to the neutral mercuric chloride solution a slight excess of hydrocyanic acid solution which is prepared from the potassium cyanide and hydrochloric acid and is neutralized against dimethyl yellow, and titrating the hydrochloric acid produced in the mixture directly with alkali, using dimethyl yellow as indicator. When the color change has taken place a small amount of hydrocyanic solution is added in order to ascertain whether or not sufficient of the acid had been added in the beginning. The neutral reaction of the mercuric chloride is found by titrating the solution in the presence of sodium chloride against dimethyl yellow. When this process is to be applied to corrosive sublimate tablets, any dye present in the tablet should first be destroyed by chlorine or bromine and any excess of bromine should be removed by the addition of phenol.—Pharm Weekbl., 57 (1920), 913. (H. E.)

Mercuric Chloride.—*Assay of Small Amounts of.*—H. Chateau adds to the solution containing a weighed quantity of the sample 0.5 mil of 5 per cent. ferrous sulphate solution followed by a few drops of 10 per cent sodium hydroxide solution. After the mercuric chloride has been reduced to calomel, the mixture is made acid with sulphuric acid, is treated with n/100 iodine and the residual iodine is titrated with n/10 thiosulphate. By this method the author was able to assay 1 milligramme of mercuric chloride in 10 mils of water.—Bull. Soc. Pharm. Bordeaux, through Pharm. Ztg., 65 (1920), 648.

Bichloride Tablets.—*Assay of.*—O. Sasse points out that these can be assayed by the method already described by him (see page 380), the only necessary modification being the bleaching out of the coloring agent used in the tablets by use of chlorine water; the excess of chlorine being expelled by evaporation prior to the titration.—Pharm. Ztg., 65 (1920), 688.

Mercuric Iodide.—*Colorless Variety of.*—According to G. Tamman, mercuric iodide may be obtained, temporarily, in colorless crystals, as follows: About 10 grammes of the salt are placed in a long tube, sealed at one end, and connected with a large vessel at the other, and heated to 300° to 350° C. The pressure is suddenly reduced to about 7 Mm., when the mercuric iodide sublimes into the large vessel and condenses as a white snow, which in a few, seconds becomes rose-pink, and ultimately the usual bright red color. By cooling the large vessel previous to the experiment the sublimate may be caused to preserve its colorless form for a longer period. The yellow variety of mercuric iodide becomes colorless at the temperature of liquid air.—Z. anorg. Chem., through Pharm. J., 105 (1920), 8.

Mercuric Iodide.—*Germicidal Value of.*—Herbert C. Hamilton directs attention to the fact that the acid radical, associated substances and conditions of the test are important factors in determining germicidal value. By the Hygienic Laboratory method mercuric cyanide has a value of 125, mercuric chloride, 1000 and mercuric iodide 5000, but these figures are not absolute. By using plain bouillon containing more beef extract and peptone the coefficient may be reduced one-third. Phenol coefficient is a meaningless term

unless the organism and the culture medium are stated. In his work on soaps, Mr. Hamilton found that in general the value of the soaps are proportional to the content of germicidal ingredient, the soap being only a vehicle. Using *Staphylococcus aureus* the value of the soap was three times that of the iodide alone and a different strain of the organism and a different culture showed some very surprising results. Soap, though without disinfecting value, may reduce bacteria materially because of its detergent action. Combining a germicide and a disinfectant gives a valuable product except that the germicide must have such a high value that the low solubility of soap, ordinarily about 1 in 100, will not dilute beyond the point of effectiveness.—J. Am. Pharm. Assoc., 9 (1920), 497. (Z. M. C.)

ALUMINUM, CERIUM AND SCANDIUM.

Aluminum.—*New Alloy of.*—It is said that aluminum containing 10 per cent. of calcium has quite a number of advantages over pure aluminum. The alloy is lighter than aluminum, can be cast, is not attacked by water, and resists corrosion better than alloys of aluminum with copper, tin or zinc. Further, it is not brittle.—Rev. Chim. Ind., through Drug. Circ., 64 (1920), 142.

Aluminum.—*Spontaneous Oxidation of.*—When pure aluminum is heated, *in vacuo*, towards 1100° it is slowly and almost completely volatilized to the extent of 97 per cent. in 73 hours. At 1200° it is entirely volatilized in 30 hours. Invariably one portion of the metal is less volatile than the rest; and frequently, after a kind of fractional distillation, a residual aluminum is obtained which has an increased affinity for atmospheric oxygen. The globule of metal thus obtained is completely transformed in the course of a month into a bulky greyish-white mixture of alumina and aluminum. It has been suggested that this peculiar property is acquired through the presence of iron or silicon as impurities in the aluminum. But analysis has shown that the spontaneously oxidizable metal contains only 0.4 per cent. of iron and 0.5 per cent of silicon. This aluminum is, therefore, much purer than the metal which has been in ordinary use for various purposes, and even for culinary utensils, without showing a tendency to oxidize. It is considered that this residual, easily

oxidized aluminum is an allotropic form of the metal.—Compt. Rend., through Pharm. J., 104 (1920), 469.

Clay.—*Use as a Medicine.*—C. B. Lowe gives an interesting historical account of the uses of clay as a medicine, both for internal administration and external use. His references to Biblical sayings in regard to clay, even as far back as the Book of Job, show again that there is "nothing new under the sun." He says that clay is best defined as "essentially a hydrated aluminum silicate, and the purest forms are kaolin, fullers' earth and porcelain clay." In some parts of the world, and particularly our own Southern States, there is a class of people who practice "clay eating." Some of this clay that is used for this purpose has been found to contain arsenic. It is hard to explain the reason for this practice of clay-eating, the agreeable salty taste and a perversion of taste being undoubtedly the main factors in creating this abnormal appetite. It is also possible that because of its "roughage properties" it prevents and relieves constipation. Its powers of absorption and adsorption may also play a large part in the feeling of well-being it gives to those who indulge in this strange habit.—Am. J. Pharm., 92 (1920), 230. (J. K. T.)

Infusorial Earth.—A. Bigot presents an interesting general paper on this subject, discussing sources, preparation at the source, properties and uses of the commercial product. He states that some of the finer grades are so light, that a liter weighs only 114 grammes.—Rev. Ingénieur, through J. pharm. chim., 22 (1920), 280.

Kaolin.—*Use as Substitute for Bismuth Subnitrate.*—Hayem recommends this salt for gastric complaints (20 grammes taken fasting before breakfast). But since the war, salts of bismuth had increased so much in price as to be beyond the means of many patients. In such cases he proposed as a substitute, kaolin in the same dose (in water) half an hour before the first meal of the day. A little anise oil might be added if necessary to render it more palatable.—Chem. & Drug., 92 (1920), 711.

Ultramarine.—*Constitution of.*—Further evidence of the relationship between ultramarines and aluminate-silicates (zeolites) is brought forward by L. Bock. In the ultramarines the sulphur com-

pounds takes the place of the combined water in the zeolites. Experiments on the action of ammoniacal silver chloride solution on artificial ultramarines indicate that the silica-rich sulphur-rich and silica-poor sulphur-rich ultramarine blues are definite compounds of formula 2 ($Na_2O,Al_2O_3,3SiO_2$) Na_2S_4 and 3 (Na_2O,Al_2O_3, $2SiO_2$) Na_2S_4 respectively. A table is given showing the known ultramarines and their relationship to natural and artificial silicates.—J. Soc. Chem. Ind., 39 (1920), 306A.

Scandium.—When Crookes in 1908, wished to investigate this element, the only available source was the Finnish mineral wiikite, one of the rarest of metals, which contains 1.2 per cent. In 1911 Schetelig described a rare Norwegian mineral thortveitite, which contains 37 per cent. and has the composition $(ScY)_2Si_2O_7$. It is found only in one locality in Norway. A. Lacroix now reports the occurrence of a mineral in Madagascar which has a constitution similar to that of thortveitite, which is available in sufficient quantity to afford material for the complete chemical investigation of scandium. Its spectrum shows the predominance of scandium, associated with yttrium and neo-yttrium, with indications of a little zirconium, aluminum and titanium. The presence of scandium is also indicated in cymophane, a mineral occurring in the same region, in which the presence of that rare metal has not been recorded previously.—L'Union Pharm., through Pharm. J., 105 (1920), 490.

Cerium.—*Sensitive Test for.*—Cerium oxide or hydroxide is colored deep-blue when moistened with benzidine acetate solution. Feigl reports that the reaction is fifty times more sensitive than Lecoq's test, and can be used for detecting cerium in iron by precipitating both metals as hydroxides and moistening the precipitate with the reagent.—Œsterr Chem. Ztg., through Drug. Circ., 64 (1920), 28.

LEAD.

Lead.—*Allotropic Form of.*—A. Thiel has confirmed the statement of Heller (1915) that compact lead kept under acidulated solutions of lead salts is converted into a brittle pulverulent allotropic form.—Ber., through Pharm Zent., 61 (1920), 425.

Lead.—*Colorimetric Assay of.*—Norman Evers criticises the colorimetric test of the British Pharmacopœia as being unsatisfactory in cases where much iron is present, in the presence of calcium and magnesium salts, and of calcium phosphate or phosphoric and glycerophosphoric acids. The author's more satisfactory methods for the determination of lead in the presence of the above chemicals are given in detail.—Pharm. J., 105 (1920), 85. (F. H.)

Lead.—*Isotopes of.*—The subject of the spectra of isotopic lead and thallium before the Royal Society, London, by T. R. Merton. Interferometer measurements of the principal line in the spectra of ordinary lead and in lead from pitchblende showed that, in the latter cases, the line was less refrangible by 0.0050A, whereas the lead from Ceylon thorite was more refrangible by 0.0022A. Thallium, which occurs in pitchblende in very small proportion was examined by alloying it with pure cadmium and was found to give a line more refrangible than that of ordinary thallium by 0.0055A.—Chem. News, through J. Ind. Eng. Chem., 12 (1920), 389.

Lead.—*Titration as Lead Chromate.*—M. Kolthoff found that lead may be titrated as chromate by the following methods. To the neutral lead solution add 3 drops of a 5 per cent. aluminum chloride solution (in order to hasten the separation of the colloidal lead chromate); the mixture is heated at 30° to 40°, an excess of lead chromate is added and the mixture is heated to boiling. The precipitate is collected on a filter, washed with boiling water until free from chromate, is then transferred back to the container in which the precipitation was made and dissolved in dilute hydrochloric acid. The solution is diluted with double its volume of water, potassium iodide is added and the separated iodine is titrated with n/10 sodium thiosulphate. Each mil of the latter corresponds to 6.9 mgms. of lead. The assay can be carried out in 15 minutes. In the case of concentrated lead solutions it is advisable to add to the solution an excess of chromate solution and titrating this excess back. Ten mils of a .5 mol lead nitrate solution is mixed with 25 mils n/10 potassium bichromate solution or potassium chromate solution and after the addition of potassium iodide, the excess of chromate is titrated back with sodium thiosulphate solution. The results varied in the case of potassium bichromate by .15 per cent.,

in chromate solution by .8 per cent. from the calculated amount. Only when the lead is combined with strong acid it may be estimated conductometrically, but not when it is combined with weak acids.—Pharm. Weekblad, 57 (1920), 934. (H. E.)

Lead.—*Volumetric Assay of.*—P. Holmsen gives the following method for estimating lead volumetrically. A sample of the substance equivalent to about 50 to 100 mgms. of lead is dissolved in the usual way, the solution is neutralized with ammonia water and then acidulated with acetic acid, keeping the volume of the solution as small as possible, in no case greater than 100 mils. After the addition of 10 grammes of ammonium acetate and heating the solution at 70° to 80°, 10 mils of a warm 5 per cent. solution of ammonium molybdate are added in a thin stream with constant stirring, the mixture is heated for 10 to 15 minutes and allowed to stand for one-half hour. It is then filtered and the precipitate washed with hot water until the filtrate no longer reacts with lead acetate solution. The precipitate is then treated with 40 to 50 mils of warm sulphuric acid (1:5), filter and precipitate are washed with boiling water (lead sulphate remains undissolved on the filter) and the filtrate after the addition of 5 to 10 grammes of zinc is boiled for 5 to 10 minutes. The liquid is then filtered, the filter washed with water and the combined filtrate and wash-water are titrated with n/10 potassium permanganate solution. According to the equations:

$(CH_3COO)_2Pb + (NH_4)_2MoO_4 = Pb\ Mo\ O_4 + 2CH_3COO\ NH_4$.

$Pb\ Mo\ O_4 + H_2SO_4 = Pb\ SO_4 + Mo\ O_3 + H_2O$.

$12\ Mo\ O_3 + 17H_2 = Mo_{12}O_{19} + 17H_2O$.

$5\ Mo_{12}O_{19} + 34\ K\ Mn\ O_4 = 60\ Mo\ O_3 + 17\ K_2O + 34\ Mn\ O$.

One mil of n/10 permanganate solution corresponds to 7.296 mgms. of lead.—Tidskr. f. kemi, through Pharm. Weekbl., 57 (1920), 328. (H. E.)

Minium.—*A Peculiar Adulteration of.*—R. Cohn examined a sample of minium which possessed an orange color instead of dark red and consisted of barium sulphate colored with an aniline dye.—Chem. Zeit., through Pharm. Weekblad, 57 (1920), 404. (H. E.)

ZIRCONIUM, THORIUM AND MESOTHORIUM.

Zirconium and Radiography.—A writer in "The World's Work" deals with the uses of zirconium as a substitute for various other metals. In America the oxide has been used as a substitute for bismuth subnitrate, which is more expensive and during the war was difficult to obtain, to render a meal opaque before an X-ray examination. For this purpose it is sold under the proprietary name "Kontrastin." In England, however, barium sulphate is preferred. —Chem. & Drug., 93 (1920), 1270.

Thorium and Mesothorium.—*American Sources of.*—H. S. Miner discussed at a meeting of the Cincinnati section of the American Chemical Society these and other rare earths, produced in America during the war. Before 1914, in the sale of some of these minerals Germany practically held a monopoly. With the development of the South, it has been found that land which is of small value for agriculture was rich in rare earths, the presence of which has been scarcely suspected. Dr. Miner spoke especially of the production and the practical use of such minerals as thorium, mesothorium and cerium, the principal commercial value of which is for the making of gas mantles. Although the rare earths from which they are derived come principally from India and from Brazil, the Germans were able to get substantial control of the handling of these elements. They imported the raw material, put it through the commercial processes, and reshipped it back to the Western Hemisphere. Dr. Miner spoke of the tremendous advances which have been made by American industrial chemistry in the last year or so, through which it was possible for these rare earths to be processed in the United States, and thereby considerable expense saved. He announced that considerable progress had been made in the turning out in commercial quantities of mesothorium, which is an intensely radioactive substance. It is chemically identical with radium, and may be used for many of the same purposes. As the demand for radium in the treatment of diseases, especially of cancer, increases, the importance of having radioactive bodies becomes more pronounced. In North Carolina and in other Southern States, deposits of these rare earths have been disclosed, and it is believed that eventually they will be not only a source of chemical independence to the country, but that their mining will add consid-

erably to the wealth of the regions in which they are found.—Am. Drug., 68 (Jan., 1920), 24.

Mesothorium.—*Therapeutic Value of.*—Carnot and Guillaume report that mesothorium administered by hypodermic injection has been successfully used in a number of cases. Its analgesic action is undoubted in both cancer and in rheumatic pains. It is very useful in the treatment of gonorrheal arthritis, and has a definite, though incomplete, action on the local infective process. In an obstinate case of erythema multiforme the effect of mesothorium injection was remarkable. Injection of a series of doses of 30 microgrammes has a marked influence in a case of hypertrophic biliary cirrhosis; the liver diminished in size, pain which had persisted for months disappeared, and intense jaundice almost entirely faded.—Paris Med., through Pharm. J., 104 (1920), 277.

ARSENIC, ANTIMONY AND TIN.

Arsenic.—*Contamination of Sugar with.*—An outbreak of arsenic poisoning in an English village was caused by the contamination of sugar. Some sixty people suffered, but none of the cases were fatal. Suspicions of food poisoning were first aroused when three members of a family were seized with severe vomiting and internal pains after drinking some tea. When it was found that another member of the family, whose tea had not been sweetened, was unaffected, the sugar on the table was removed for examination. It was discovered that a barrel of moist sugar recently arrived had become contaminated during transit by rail with a leakage from a can of weed killer, which contained arsenic.—J. Am. Med. Assoc., through Pract. Drug., 39 (Dec., 1920), 36.

Arsenic.—*Therapeutic Value of.*—At a meeting of the Therapeutical Society, M. Carle said that arsenic had been reintroduced for skin diseases, after some hundreds of years, at the commencement of the nineteenth century. Nothing justified its use, and the absorption of arsenic might provoke skin diseases. Arsenic, he maintained, has never ameliorated dermatitis in any form.—Chem. & Drug., 92 (1920), 711.

Arsine.—*Production and Assay of.*—Thoms and Hess describe a method for first producing calcium arsenide by heating metallic

calcium in arsenic vapors and preventing the ordinarily violent reaction by addition of neutral substances such as sand, etc. By means of a special apparatus the resulting calcium arsenide is treated with water, thereby liberating arsine gas and hydrogen. The volume of this mixture is noted. The arsine gas is absorbed by means of a solution of copper chloride and the volume of hydrogen remaining is determined. The difference in volumes represents the quantity of arsine found.—Ber. dtsch. Pharm. Ges., 30 (1920), 483. (H. H. S.)

Arsenous Acid.—*Reversible Oxidation of.*—Matignon and Lecanu find that arsenous oxide, when heated with oxygen at 400° to 480° under a pressure of 127 to 180 atmospheres, is oxidized to an extent which increases with rise in temperature. A concentrated solution of arsenous acid in sodium hydroxide solution, when heated at 80° in oxygen under a pressure of 50 atmospheres for 5 hours, is oxidized to the extent of 10.9 per cent.—Compt. rend., through J. Soc. Chem. Ind., 39 (1920), 402A.

Arsenites.—*Lithium and Potassium.*—Schreinemakers and De Baat report that lithium forms one arsenite, $LiAsO_2$, and potassium forms two arsenites, $K_2As_4O_7$ and $K_6As_4O_9,12H_2O$, all of which are soluble in water without decomposition.—Rec. Trav. Chim., through J. Soc. Chem. Ind., 39 (1920), 515A.

Arsenic Acid and Arsenates.—*Iodometric Assay of.*—After a discussion of the reaction $As_2O_3 + 2I_2 + 2H_2O \rightleftarrows As_2O_5 + 4HI$ and of the assay methods devised from this reaction, P. Fleury recommends the following assay of arsenates, which, in his hands, have brought excellent results:

In a 250 mill glass-stoppered Erlenmeyer flask is placed 30 mils of a aqueous solution containing slightly less than the amount of arsenate is equivalent to 50 mils of tenth-normal iodine (*e. g.*, 0.70 Gm. $Na_2H\ AsO_4\ 7H_2O$). To this is added 3 mils of hydrochloric acid (Sp. Gr. 1.171) after which the mixture is heated in a water-bath for five minutes and then after addition of a 25 per cent. potassium iodide solution and the mixture is heated for 5 to 10 minutes longer in the water-bath. If the concentration of the mixture is correct, the reaction $As_2O_5 + 4HI = As_2O_3 + 2I_2 + 2H_2O$ will take place quantitatively.

The iodine thus liberated is removed by titration with tenth-normal thiosulphate until a colorless fluid is obtained, after which the resulting As_2O_3 is oxidized back to As_2O_5 by careful titration with tenth-normal iodine.—J. pharm. chim., 21 (1920), 385.

Antimony.—*Rôle in Tropical Medicine.*—R. G. Fargher gives an interesting historical review of antimony and its inorganic compounds and compares it with arsenic.

He tells of the difficulty of preparing organic antimony compounds but thinks that investigation of them should be continued, as conditions in the tropics when disease is rampant or on account of poor sanitary conditions which will continue so for years, makes them of a very real economic importance.—J. Soc. Chem. Ind., 39 (1920), 333R. (J. M. W.)

Antimonyl-Sodium Tartrate.—*Use in Kala-Azar.*—J. D. Price relates his experiences while in Assam in the treatment of kala-azar by intravenous solutions of antimony. Dr. Price used, and strongly recommends, the employment of solutions of antimonyl sodium tartrate in preference to any other salt of antimony. The majority of cases were cured after a course of 30 grains, 1½ grain in 10 mils of normal saline solution being regarded as the full dose, and, as the initial dose, 4 mils of solution of this strength. The median basilic vein was usually selected, and the skin over the vein painted with iodine. The injections were always given when the patient's stomach was empty, and he was made to lie down for half an hour afterwards. If there was the slightest tendency towards coughing, the next injection was reduced by one-half mil.—Brit. Med. J., through Chem. & Drug., 93 (1920), 1629.

Tin.—*Indirect Identification of.*—By dissolving the sulphides obtained in qualitative analysis in hydrochloric acid and eliminating the antimony by metallic iron, the tin is obtained in the form of stannous chloride which is then identified by means of mercuric chloride. This method presents at times some difficulties, especially because it is not always easy to get a colorless stannous chloride solution. In order to overcome these difficulties Dr. Feigl reduces the ferric ion to ferrous ion by stannous chloride and then converts the ferrous ion into complex compounds by means of dioximes in an alkaline or neutral solution. He proceeds as follows: The

sulphides of antimony and tin are dissolved in strong hydrochloric acid and into a part of the mixture iron wire is placed in order to find out whether or not antimony is present. In the remainder of the liquid, antimony and tin are precipitated by zinc (free from iron and lead) and the spongy precipitate obtained, after being well washed with water, is treated with strong hydrochloric acid by which the tin is dissolved. A small amount of antimony may be dissolved but this does not interfere with the following reaction. To the solution of tin, warm diluted ferric chloride solution is added, followed by a small amount of Rochelle salt or citric acid (in order to retain iron hydroxide in solution) and an alcoholic ammoniacal solution of dimethylglyoxine consisting of 500 mgms. of dimethylglyoxime, 5 mils of alcohol and 5 mils of strong ammonia water. In the presence of stannous ion the ferrous ion produces a deep red color, the intensity of which depends on the amount of tin present. —Chem. Zeit., through Pharm. Weekbl., 57 (1920), 385. (H. E.)

Tin.—*New Test for.*—A. Mazuir found that both stannic and stannous iodide are completely insoluble in concentrated sulphuric acid and that this property of the tin salts can be used for the identification of tin. One to two mils of the liquid under examination are mixed with an equal volume of 10 per cent. potassium iodide solution and the mixture is shaken with 1 to 2 mils of concentrated sulphuric acid. In the presence of 100 to 200 mgms. of tin salt in one liter of solution a characteristic yellow precipitate is produced. Arsenic gives a similar precipitate which, however, unlike the tin iodide, is insoluble in strong hydrochloric acid. Antimony yields a red precipitate.—Ann. Chim. anal. appl., through Pharm. Weekbl., 57 (1920), 710.

Tin.—*Volumetric Assay of.*—After trying the various methods of titrating stannous tin, J. G. F. Druce concludes that titration with iodine in the presence of hydrochloric acid is most satisfactory. Potassium stanno-chloride was chosen for the preparation of standard tin solution.—Chem. News, 121 (1920), 173. (J. H.)

Arsenic, Antimony and Tin.—*Separation of.*—According to Petersen, when the combined sulphides are boiled with water and sodium peroxide, on cooling, sodium antimonate $Na_2H_2Sb_2O_7$, separates from the alkaline solution. In the presence of a large

amount of tin, stannic acid separate as floccules from the hot solution and can easily be removed by filtration. The filtration from the sodium antimonate is tested for arsenic in the usual way. Another method is given by Hahn. The mixture of the three sulphides and sulphur, precipitated from the solution in yellow ammonium sulphide by hydrochloric acid, is extracted in the cold with 5 per cent. sodium sulphide solution, by which the sulphides are dissolved while the sulphur remains undissolved as a fine powder. To the filtrate 10 per cent. sodium hydroxide solution is added (twice as much as the sodium sulphide solution used for dissolving the sulphides), followed by hydrogen dioxide solution until an evolution of oxygen takes place. The mixture is heated to boiling, when antimony is precipitated as $Na_2H_2Sb_2O_7$, the precipitation being made complete by the addition to the liquid of one-quarter its volume of alcohol. From the filtrate the alcohol is expelled by heating and to the remaining liquid, ammonium nitrate is added, by which tin is precipitated as stannic hydroxide. The mixture is then boiled in order to expel the ammonia, the stannic hydroxide is collected on a filter, washed, and in the filtrate the arsenic is precipitated with magnesia mixture in the usual way. The stannic hydroxide is dissolved in a small amount of hydrochloric acid, the stannic chloride reduced by the addition of zinc and the tin is identified by means of mercuric chloride solution.—Z. anorg. Chem., through Drug. Circ., 64 (1920), 381.

Tin and Antimony.—*Separation of.*—Kling and Lassieur continuing the work of M. Auger have examined the use of cupferron in the estimation of tin. After examining many methods for the separation of tin and antimony, none of which gave complete satisfaction, they concluded that F. W. Clarke's method (Treadwell, "Quantitative Analysis," p. 231) gave the best results. The method consists of the precipitation of antimony by hydrogen sulphide in the presence of strong oxalic acid. Vortmann and Metzel's modification in which phosphoric acid replaces oxalic acid, according to the authors, gives fairly good results for antimony, but the results for tin are bad. The authors have had quite good results by the separation of tin and antimony by hydrogen sulphide in the presence of hydrofluoric acid. They admit that this is not a new method, it being the subject of many memoirs. The principle of the operation is that if stannic salts are in the presence of hydro-

fluoric acid a complex salt is formed, the constitution of which is not well known; but tin in this condition can be separated from other elements, antimony for example, either by hydrogen sulphide or electrolysis. It is then easy to break up the tin compound by the addition of boric acid. With modifications the authors have followed the method as laid down by Le·Roy W. MacCay, chiefly using cupferron for precipitating the tin, which on igniting gave SnO_2. The authors then give a detailed account of the method they adopted, with their results, which are:

Theoretical.		Found.	
Sn.	Sb.	Sn.	Sb.
0.198	0.0428	0.197	0.042
0.305	0.0042	0.305	0.0038
0.326	0.118	0.327	0.117

BISMUTH.

Bismuth and Lead.—*Separation of.*—G. Luff gives the following method for separating lead from bismuth. The solution of the metals in nitric acid is neutralized as much as possible by ammonia water, concentrated ammonium nitrate and 6 per cent sodium nitrite solutions, previously neutralized with nitric acid, are added, followed by sufficient water to obtain about 200 mils and the liquid is boiled until nitrogen is no longer evolved. The precipitate consisting of bismuth hydroxide or basic nitrate is then collected on a filter, is washed well with hot water, is then dissolved in nitric acid, the solution is evaporated and the residue ignited and weighed as Bi_2O_3. The filtrate, which generally does not contain nitrite, is acidulated with acetic acid, boiled, and the lead is estimated as lead chromate in the usual way. The results for lead obtained by this method are very good while those for bismuth are slightly high on account of the presence of alkali and silicic acid. In order to remove the later, the residue in the platinum crucible is heated with nitric acid and hydrofluoric acid. To remove the alkali the bismuth oxide in the crucible is washed with hot water, etc.—Chem. Zeit., 44 (1920), 71. (H. E.)

CHROMIUM AND MANGANESE.

Chromates.—*Lead.*—Groeger reports that when 20 mils of normal potassium chromate solution are added to 19 mils of normal lead acetate solution, normal lead chromate is precipitated. By evaporating a mixture of 40 mils of normal lead acetate solution and 10 mils of potassium chromate solution on a water bath and washing the residue with water, basic lead chromate $Pb.O.PbCrO_4$ is obtained, while by triturating 2 grammes of lead chromate with 30 mils of normal potassium acetate solution, evaporating the mixture to dryness and washing the residue with water, a lead-potassium chromate $2PbCrO_4K_2CrO_4H_2O$ is formed.—Z. anorg. Chem., through Drug. Circ., 64 (1920), 298.

Manganese.—*Amount Present in Iron Preparations.*—E. Maurin pointing out that the work of Bertrand emphasized the physiological importance of manganese in the human body, reports upon his own investigation as to the manganese content of the usually prescribed iron preparations. His colorimetric assays indicate the following percentages: Powdered iron, 0.10 to 0.60; reduced iron, 0.07 to 0.40; iron carbonate (sesquioxide 0.08 to 0.30; iron sulphate, 0.02 to 0.25; iron and ammonium citrate, 0.01 to 0.15; iron glycerophosphate, 0.03 to 0.20; iron lactate, 0.02 to 0.20; iron oxalate, 0.01 to 0.22; and iron and potassium tartrate, 0.01 to 0.10.—Rep. Pharm., through Pharm. Zent., 61 (1920), 299.

Manganese.—*Detection in Presence of Phosphates.*—Sabalitschka and N. Erdman discuss the method of detecting manganese as described in "Anleitung zur qualitativen Analyse" by E. Schmidt. The article cannot be understood properly without a copy of this book at hand since it refers to methods and chapters therein without however quoting them.—Ber. dtsch. Pharm. Ges., 30 (1920), 443. (H. H. S.)

Manganese.—*Industrial Poisoning by.*—Chronic manganese poisoning is known to have occured in only three types of employment—in French workers handling black oxide of manganese in the manufacture of chlorine, among Germans engaged in grinding pyrolusite, and among mill operatives in the United States working in a dust containing manganese as oxides and silicates. Edsall, Wilbur and Dronker report that after working in manganese dust

for at least three months, the following symptoms of poisoning may appear: languor, sleepiness, mask-like facial expression, low monotonous voice, muscular tremor or twitching, cramp, slight increase of tendon reflex, ankle and patella clonus, a peculiar stepping gait, and hysterical laughter or tears. No disturbances of sensation, eye changes, or abnormal reactions of blood, urine, or secretions are detectable. After the harm is done, no known treatment is of any value. Early cases recover spontaneously if removed to a dust-free environment. The problem, therefore, is one of prevention alone, limited to the removal of dust from the atmosphere, and detection of early symptoms by frequent medical examination.—J. Ind. Hygiene, through Pharm. J., 104 (1920), 523.

Manganese.—*Volumetric Assay of.*—In using von Knorr's method for the volumetric estimation of manganese by precipitation with ammonium persulphate as the dioxide, a re-solution of the precipitate in an excess of a reducing solution and back titration with a standard solution of potassium permanganate, the theoretical factor is 1 gramme. Fe=0.4917 gramme Mn. In practice, according to Nicolardot, Réglade and Geloso, a higher factor is necessary, owing to slight variation in the composition of the precipitate. The variations are due mainly to the presence of iron. In the absence of iron the factor found was 0.498, and in the presence of 40 per cent. of iron 0.4929. When the solution in which the precipitation takes place contains more than 10 per cent. of sulphuric acid the precipitation of the manganese is incomplete.—Compt. rend., through J. Soc. Chem. Ind., 39 (1920), 351A.

Potassium Permanganate.—*Bleaching with.*—Kind finds that bleaching with permanganate should be carried out in acid solution, but hydrochloric acid should not be used, because it liberates chlorine, which attacks the cellulose. Reducing the alkalinity with magnesium sulphate gives no satisfactory results, and by doing so, at times the strength of the bleached goods is reduced. Strong baths of permanganate are also dangerous.—Z. ges. Textilind., through Drug. Circ., 64 (1920), 102.

IRON, COBALT AND NICKEL.

Iron.—*Hematoxylin as Reagent for.*—Mawas finds hematoxylin is an excellent reagent for iron in tissues. While not as sensi-

tive as the Prussian blue reaction, it is better adapted to histological work. In using it, however, it must be borne in mind that it strikes with the chromatin of the cell nucleus a color simulating that shown with iron. Mawas does not agree with Macallum's conclusions as to the mechanics of the hematoxylin-iron reaction.—Compt. rend. Soc. Biol., through Pharm. Zent., 61 (1920), 272.

Iron.—*Volumetric Assay of.*—J. Houben recommends an assay of iron, either ferrous or ferric, by use of colloidal ferrous sulphide solution (see page 427) as indicator. A solution of the iron salt is treated with hydrogen sulphide and the acid of the salt thus freed is titrated with normal alkali solution, using the iron sulphide indicator. For details concerning calculation of amount of iron when free acid is present or absent, the reader is referred to the original article.—Ber., through J. pharm. chim., 21 (1920), 360.

Richmond and Ison describe a method that is applicable in the presence of hydrochloric acid, phosphorus oxy-acids, and organic matter, and was primarily devised for the estimation of iron in syrups. Coloring matter is destroyed and the iron converted to the ferric state by means of potassium permanganate in the presence of hydrochloric acid. Strong hydrochloric acid and sodium bicarbonate are then added to produce a CO_2 atmosphere, and the ferric iron then titrated with N/10 stannous chloride using thiocyanate as indicator. The paper included detailed hints upon the manipulation of the method.—Chem. & Drug., 92 (1920), 647.

Iron Compounds.—*The Thiocyanate Test for.*—R. Willstätter has devised a colorimetric assay for minute quantities of iron based upon the thiocyanate reaction, comparing the color of the unknown sample against that produced in a standardized iron sample, using a Dubosq colorimeter as comparison apparatus. Willstätter points out that the addition of an excess of ammonium thiocyanate lessens the color produced; hence the assay should be carefully devised.—Ber., through Schweiz. Apoth. Ztg., 53 (1920), 578.

Colloidal Iron.—*Influence on the Viscosity of the Blood.*—Thieulin and Bernard find that "electric colloidal iron" has the property of aiding desanguinated animals to a rapid return to the normal viscosity of thin blood, by the molecular enrichment of the blood masses.—J. pharm. chim., 21 (1920), 208.

Dialyzed Iron.—*Assay of Chlorides in.*—To estimate chlorides in dialyzed iron Mossler directs adding to 10 mils of the sample, 10 mils of N/10 silver nitrate solution and 4 to 5 mils of strong nitric acid and evaporating the mixture to dryness on a water bath. The residue is taken up in diluted nitric acid and the excess of silver is titrated back with N/10 ammonium thiocyanate solution, of which not more than 3 mils should be used. The addition of an indicator is not necessary.—Pharm. Post., through Drug. Circ., 64 (1920), 64.

Iron Filings.—*Assay of.*—H. Hindley recommends the following modification of the Peck (1898) method: 0.25 gramme of iron filings and 1.25 gramme of copper sulphate were ground together in a small mortar thoroughly to subdivide the filings, and were then rinsed into a narrow 4000 mil glass beaker, with about 60 mils of cold water. The contents of the beaker were then brought to the boil and kept briskly boiling till reduced to about 15 mils, then rapidly filtered, preferably at the pump, through a Gooch crucible, or through a small Buchner funnel. The time of filtration is thus reduced to a few seconds, lessening the chance of oxidation and mechanical loss. Filtration must be thorough, and no trace of precipitate must be allowed to remain in the solution, for it has a strong reducing action on the permanganate. Wash with about 100 mils of cold water, add sulphuric acid, and titrate with permanganate as usual.—Chem. & Drug., 92 (1920), 150.

Cobalt.—*Detection in Nickel.*—For detecting small amounts of cobalt in nickel Coupin acidulates the nickel solution with a few drops of hydrochloric acid and adds a slight excess of a freshly-prepared 5 per cent. aqueous solution of potassium xanthogenate. An equal volume of ammonia water is added to the liquid to which the voluminous precipitate of nickel xanthogenate is dissolved, forming a deep blue solution, while cobalt xanthogenate

remains undissolved and settles as small green granules. When the mixture is shaken with an amount of ether insufficient to dissolve all the nickel xanthogenate, the ether is colored green when as little as one part of cobalt is present in 2000 parts of nickel.—Bull. Sci. Pharmacol., through Drug Circ., 64 (1920), 382.

Cobalt.—*Sensitive Reagent for.*—J. Belluci found that as little as one milligramme of cobalt in 17 liters of water can be detected by means of beta-nitroso-alpha-naphthol. By alpha-nitroso-beta-napththol, only one milligramme can be detected in one or two liters. The reagent produces a pink or garnet red color, the intensity varying with the amount of cobalt present.—Gazz. Chim. Ital., through Pharm. Weekbl., 53 (1920), 890. (H. E.)

Cobalt.—*Detection in the Presence of Nickel.*—Albert Metzl reports that cobaltonidyl compounds are oxidized with hydrogen peroxide to higher cobaltonides, these on boiling with sodium hydroxide are converted into cobalt hydroxide. The precipitate is dissolved in sulphuric acid, potassium iodide is added and the iodine set free is titrated with thiosulphate.

Another method is based upon the difference of action of ammonia and ammonium chloride on cobalt and nickel compounds. —Pharm. Zent., 61 (1920), 371. (O. M.)

PLATINUM.

Platinum.—*Production in Russia.*—U. S. Consul A. R. Thomson at Omsk, under date of September 9, 1919, reports on the composition of the crude platinum deposits in the mining districts of the Ural Mountains in Russia. The percentage of pure platinum contained in these deposits of crude ore is given as well as the percentage of other minerals combined therein. Platinum was discovered in the Urals in 1819 but was not made use of until 1825, when the Russian Government began to employ it for the coinage of 3-ruble pieces. Up to 1845, the currency was coined to approximately $2,125,000. From 1880 to 1890 the average annual production of platinum amounted to 8,800 pounds. In 1901 it had reached 17,072 pounds. The refined platinum is generally obtainable in the form of leaves or wire.

This metal is only found in Russia in the Urals. While it is a fact that platinum is found in Colombia, Australia, Oregon and in California, these combined do not produce more than 10 per cent. of the world's output.—Am. J. Pharm., 92 (1920), 114. (J. K. T.)

Platinic Chloride.—*Use in Pneumonia.*—Anklesaria has obtained excellent results from the use of 0.1 per cent. platinic chloride solution in 5 minim doses in the treatment of pneumonia. He uses it in connection with the following prescription:

℞ Sodii bicarbonatis ..... 4.
Misturæ quininæ carbonatis..... 8.
Vini ipecacuanhæ ..... 2.
Syrupus aurantii..... 24.
Aquæ anisi, q.s. ad.....180.

Signa: One ounce every four to six hours.

The mistura quininæ carbonatis, mentioned in the prescription, is made by mixing together one part of quinine and one part ammonium carbonate, then making into a paste by trituration with one part of ammonia water, letting stand one hour, then adding 4 parts of absolute alcohol, filtering and finally adding the filtered liquid to 16 part of aromatic spirits of ammonia.—Indian. Med. J., through Am. J. Pharm., 62 (1920), 62.

ORGANIC CHEMISTRY

GENERAL SUBJECTS.

Alcoholic Fermentation.—*Theory of.*—In outline the theory of Neuberg and Reinfurth is: Sugar is converted into methylglyoxal, which may be hydrated and reduced to glycerol or oxidized to pyruvic acid, this breaking down into carbon dioxide and acetaldehyde, which is reduced to alcohol. In the presence of sulphites, the best being calcium sulphite, as is now shown, the acetaldehyde is fixed, and the available hydrogen works in the direction of the production of glycerol. In fact, practically equimolecular proportions of aldehyde and glycerol are pro-

duced, and in the more concentrated solutions the quantitative realization of the reaction,

$$C_6H_{12}O_6 = CH_3CHO + C_3H_5(OH)_3 + CO_2,$$

has been achieved as well as might be expected of such a biochemical process. This evidence, therefore, strongly supports the theory.—Ber., through J. Soc. Chem. Ind., 39 (1920), 76A.

Castellana's Reaction.—For detecting nitrogen in organic compounds Castellana heats the substance to red heat with sodium or potassium carbonate and metallic magnesium. The method is, therefore, a modification of Lassaigne's process in which sodium or potassium is used instead of magnesium. J. Flieringa found that by Castellana's method erroneous results are liable to be obtained, especially when too much magnesium is taken in the test. By heating the mixture for too long a time atmospheric nitrogen apparently combines with the magnesium with the formation of magnesium nitride which later on is converted into cyanide. Thus nitrogen may be found in substances which are completely free from this element. He, therefore, recommends heating the substance with a mixture of 2 parts of incompletely dehydrated sodium carbonate and one part of magnesium and adding to the mixture a small amount of a nitrogen-free substance such as sugar, etc. The vapors produced in the igniting process expel the air and prevent combining of the atmospheric nitrogen with the magnesium.—Pharm. Weekbl., 57 (1920), 3. (H. E.)

Chemical Synthesis.—*Triumphs of.*—A. Gawalowski discusses the many organic products now made synthetically. Among these he cites synthetic albuminoid materials that closely resembles from the organoleptic, culinary and gastronomic standpoints egg albumin and egg yolk.—D.-A. Apoth. Ztg., 40 (1920), 144.

Ester Formation.—*Factors Influencing.*—E. Preiswerk points out that while malonic acid forms esters with ease, diethylmalonic acid does so only with great difficulty. It has been assumed the "strength of the acid" (degree of ionization?—Ed.) was an important factor in ester formation, but in the present

case, diethylmalonic acid is a "stronger" acid than is malonic acid. Preiswert raises the question whether the presence or absence of hydrogen atoms on the carbon standing in alpha position to the carboxyl group may not be a factor.—Helv. Chim. Acta, through Pharm. Zent., 61 (1920), 150.

Food Products.—*Fuel Value as Index of Its Nutritive Value.*—J. W. England directs attention to the limitations in the general assumption that caloric value is a true indication of food value. Proteid supplied heat but is also a tissue builder while fats and carbohydrates form tissue. Nutritive equilibrium can be maintained only on a mixed diet which will furnish sufficient heat for bodily functions and develop or repair tissues. Authorities differ in the standards set for adults, and Mr. England cites a number of these. The proteid needs of a growing child are greater than for an adult when only enough for maintenance and repair is demanded. Figures are given to show percentages of various tissues and their increase from birth to maturity. Proper balance of food is important and the individual factor must be kept in mind when determining formulas.—J. Am. Pharm. Assoc., 9 (1920), 375. (Z. M. C.)

Food Products.—*Assay of Moisture in.*—The water in food products is present either as a solvent, or colloidally combined, or as water of crystallization or in an occluded state. K. Schersiga found that by drying food products at 100° erroneous results are obtained because at this temperature substances like glycerin, phosphoric acid, etc., and products containing colloidally combined water are not completely dehydrated, while at a higher temperature substances other than water may be volatilized. He, therefore, recommends the distillation method, carried out according to Sjallema in a copper kettle to which a specially constructed condenser is attached. The heating is done by adding to the substance xylene and heating the mixture to boiling, when the xylene, on account of its high boiling point, carries the water over. In order to prevent burning of the mixture, glass beads, gravel or sand are added to the mixture. The determination was carried out with good results on 12 different substances such as potato starch, powdered milk, apples, spinach, jam, cheese and bread.—Pharm. Weekbl., 57 (1920), 398. (H. E.)

Stutterheim and Lazet give the following methods for determining the moisture in bread, sausage and powdered cocoa. Fifty grammes of the bread are heated for 16 hours at 60° in an air oven and weighed. On drying the bread further to constant weight, it was found that in order to obtain the absolute amount of moisture, the loss in weight obtained in the first process should be multiplied by the factor 1.029. The drying of the sausage was done by mixing 10 grammes of the product with 7.5 mils of alcohol and 20 grammes of sand and heating the mixture for 2½ hours on the water bath. The factor for calculating the exact amount of moisture is 1.031. Powdered cocoa is heated for one hour in an air bath at 100° and the factor 1.235 is used in the calculation.—Pharm. Weekbl., 57 (1920), 457. (H. E.)

Kjeldahl Assay.—*Absorbing the Fumes During Digestion.*—In the first step of the Kjeldahl nitrogen assay, the digestion of the sample in boiling sulphuric acid, the fumes given off from the digestion flask are very annoying. G. K. A. Nonhebel reduces the nuisance to the minimum by setting the Kjeldahl flask at an angle of 30° and then inserting its neck into an ordinary glass urinal, which is about one-third full of sodium hydroxide solution.—Pharm. Zent., 61 (1920), 481.

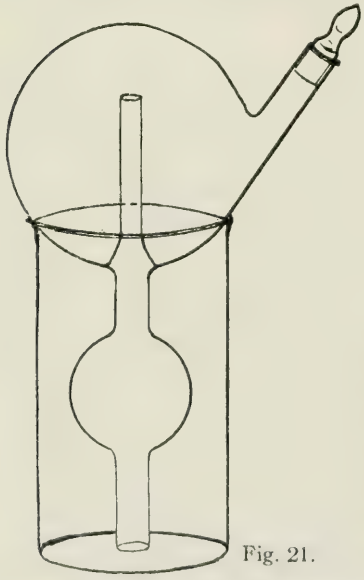


Fig. 21.

Kjeldahl Assay.—*Simple Distilling Apparatus for.*—H. Citron describes an apparatus by which the distillation of the ammonia obtained in the nitrogen estimation according to Kjeldahl can be carried out very easily. The apparatus (Fig. 21) consists of a bulb (250 mil contents) of Jena glass, provided with a glass-stoppered side tube. Into the bottom of the tube a glass tube is fused, which outside of the

bulb is widened to a bulb of about 50 mils contents. The bulb is placed on a beaker of about 250 mils contents. For carrying out the distillation, 25 mils of N/20 sulphuric acid and 50 mils of water are placed into the beaker and the bulb is placed upon the beaker. Through the tube, 10 mils of 40 per cent. caustic potash solution are introduced into the bulb and then the digestion liquid which has been neutralized with strong alkali and then slightly acidulated with acetic acid. The bulb is then closed by the glass stopper which has previously been dipped into syrupy phosphoric acid. The apparatus is then placed into an air oven at 170° for one hour. The distillation takes place without bumping or frothing and since the apparatus is only small in size, several apparatus can be placed into the same air bath. When the heating is finished the glass stopper is removed, the bulb is placed on another beaker containing 25 mils of water, is stoppered again, when by contraction of the air in the bulb the water will rise in the tube and thus wash it. In the combined acid and wash water the excess of acid is titrated back with volumetric alkali solution.—Deutsch. med. Wsch., through Pharm. Weekbl., 57 (1920), 889. (H. E.)

Odor Chemistry.—*Principles of.*—L. Ruzicka believes that the foundation of the science of odors is a satisfactory definition of an odorous substance. This, he thinks, should be: "An odorous substance is a body which is soluble in the air and which reacts with certain substances in the mucous membranes of the nose, thereby exciting the odor nerves." To the substances in the mucous membrane of the nose, he gives the name "osmoceptors." The rest of the article discusses the relation of odor to chemical constitution.—Chem. Ztg., through Pharm. Ztg., 61 (1920), 274.

Organic Compounds.—*Assay of Bromine in.*—F. Wunsch heats the substance with sodium peroxide in a nickel basin first on the water bath, then over a free flame, and eventually incinerated. The ash is washed out with distilled water, the solution filtered, and the filtrate neutralized with concentrated sulphuric acid and treated with potassium permanganate and sulphuric acid. The free bromine is blown over by means of a current of air into a vessel containing a known volume of fuchsin and sulphurous acid, and estimated colorimetrically by comparing the violet coloration which is produced

with a set of standards. Two milligrammes of neuronal were estimated in 30 mils of blood with an error of 12 per cent. Neuronal, adaline, and bromural were estimated in frog's tissue by this method with an error of about 7 per cent.—Arch. Exp. Path. Pharmakol., through J. Soc. Chem. Ind., 39 (1920), 503A.

A Damiens dries the organic matter at 100° to 105°, mixes it with 5 parts of potassium nitrate and 10 parts of sodium carbonate and heats it in a silver crucible to just short of fusion. After cooling, the mass is extracted with water and the solution filtered. In a portion of the filtrate the iodine is estimated either by Labat's method (distillation in presence of iron-ammonium alum), or by precipitation as silver iodide, subsequent liberation by chlorine, and colorimetric estimation in chloroform solution. In another portion of the filtrate the whole of the halogens are precipitated as their silver salts, which are afterwards decomposed by zinc and sulphuric acid, the silver being filtered off, and the bromine estimated in the filtrate by the method of Denigès and Chelle. In the presence of iodide, the iodine is first removed from the last filtrate by Labat's method before the bromine is estimated. Chlorine is estimated by difference from the total halogen content.—Compt. rend., through J. Soc. Chem. Ind., 39 (1920), 804A.

Organic Compounds.—*Assay of Iodine in.*—Rupp and Lehmann proceed as follows: Twenty mils of sulphuric acid and 25 mils of N/10 silver nitrate solution are heated in a 500-mil Kjeldahl flask until sulphuric acid fumes are evolved. The mixture is allowed to cool, 2.5 grammes of finely powdered potassium permanganate are added and then the substance under examination contained in a small glass tube. After the addition of 5 mils of water, the mixture is rotated for 15 minutes and is then heated until all the manganese dioxide is practically dissolved and a deep-blue solution is obtained. The mixture is again allowed to cool, a freshly prepared solution of 5 grammes of ferrous sulphate in 100 mils of water is added and after shaking well, in order to coagulate the silver iodide, the clear supernatant liquid is decanted, the silver iodide is washed with 20 to 30 mils of water and in the aqueous liquid the excess of silver is titrated back with N/10 ammonium thiocyanate solution. For the estimation of iodine in airol the following process is given: 0.5 gramme of the substance is boiled with 25 mils of 25 per cent.

nitric acid and 20 mils of N/10 silver nitrate solution for 2 to 3 minutes. After cooling, 50 mils of water are added to the mixture and then potassium permanganate to oxidize any nitrous acid. The excess of permanganate is then removed by the careful addition of ferrous sulphate and the excess of silver is titrated back with N/10 ammonium sulphocyanate solution. The method can also be applied for the estimation of bromine in organic substances.—Arch. Pharm., through Drug. Circ., 64 (1920), 218.

Organic Compounds.—*Assay of Mercury in.*—According to A. Wöber, the mercury may be obtained in solution, in a suitable condition for its determination by Rupp's iodometric method by heating 0.5 gramme of the substance with sulphuric acid at 60° in a flask fitted with a tapped funnel and a delivery tube connected with a Peligot tube which is cooled with water; 1 mil of concentrated hydrogen dioxide solution is added, drop by drop, to the contents of the flask, and the heating is continued until a clear solution results and sulphur trioxide fumes appear in the Peligot tube. The solution is then cooled, diluted, treated with 1 gramme of sodium chloride, neutralized with sodium hydroxide solution (sp. gr. 1.3), mixed with the rinsings from the Peligot tube, and diluted to 100 mils.—Z. angew. Chem., through J. Soc. Chem. Ind., 39 (1920), 385A.

Organic Compounds.—*Detection of Arsenic in.*—A. Ganassini finds that the introduction of platinum chloride into the hydrogen flask of Marsh's apparatus retards or prevents the appearance of the arsenic deposit in the case of cacodylic acid. In the presence of a large excess of platinum chloride cacodylic oxide forms a yellow precipitate of cacodyl platinochloride. If, however, only a small amount of platinum chloride is introduced, cacodylic oxide is evolved sooner or later. Even for the detection of mineral arsenic it is not advisable to use platinum chloride, since arsenic may be fixed as platinum arsenide, with a loss of as much as 50 per cent. of the arsenic present. The yellow ring, probably of erythrarsine, produced, together with the ordinary black deposit, by cacodylic acid in the Marsh test is a characteristic reaction. It may be obtained quantitatively by immersing the evolution flask of Marsh's apparatus in a bath of molten lead (about 335°). Atoxyl and salvarsan give the ordinary arsenic deposit in Marsh's test, but neosalvarsan and

methylarsinic acid behave in an analogous manner to cacodylic acid, giving a yellow ring under the same conditions. In the case of cacodylic acid, however, the gas forms dense white fumes, and when conducted into Bettendorf's reagent (stannous chloride solution saturated with hydrogen chloride) it does not form a yellow precipitate. In the case of methylarsinic acid the formation of the yellow ring is not accompanied by the appearance of white fumes, and the gas gives an abundant precipitate with Bettendorf's reagent. The lemon-yellow ring given by neosalvarsan may be distinguished from the other two by the fact that it is only formed at a high temperature, does not change to black, and is rapidly dissolved by ammonia solution.—Boll. Chim. Farm., through J. Soc. Chem. Ind., 39 (1920), 42A.

Organic Compounds.—*Rapid Assay of Carbon in.*—L. Lescoeur finds that the conversion of carbon into carbonate by fusion with alkaline hydroxide and nitrate:

$$5C + 6NaOH + 4NaNO_3 = 5Na_2CO_3 + 2H_2O + N_4$$

runs quantitively both with carbon samples and with organic substances. He uses a hydroxide solution entirely free from carbonate, a mixture of sodium and potassium nitrates, since more easily fusible than either salt alone, and performs the fusion in a silver crucible.

The carbonate content of the resulting sodium carbonate is determined by precipitating calcium carbonate by adding to a solution of the fused mixture a solution consisting of 219 grammes of crystalline calcium chloride, 107 grammes of ammonium chloride and enough distilled water to make 2 liters. The precipitated calcium carbonate after being washed may be weighed directly or may be dissolved in normal hydrochloric acid and the excess of acid then titrated.

The paper gives results of this assay as performed on such diversified material as animal and vegetable charcoal, graphite, coke, glucose, rock candy, oxalic acid, sodium acetate, urea and various samples of urine, the assays being checked up by the regular methods of carbon determination. In most cases the results were in close accord.—J. pharm. chim., 21 (1920), 257.

Organic Compounds.—*Representation of Isomerism and Tautomerism.*—I. W. D. Hackh explains isomerism, tautomerism and

pseudomerism by means of his chemical hieroglyphics.—Chem. News, 121 (1920), 85.

Organic Salts.—*Assay of Alkali in.*—C. F. Van Duin evaporates the alkali salt with concentrated sulphuric acid until fuming ceases. The resulting mixture of sulphate and pyrosulphate is dissolved in a little ammonium carbonate solution, the solution is evaporated to dryness, and the residue gently ignited. In this way losses by spurting are avoided, and any carbonaceous matter is easily burned off.—Chem. Weekbl., through J. Soc. Chem. Ind., 39 (1920), 521A.

Phenol Coefficients.—*Some.*—Geo. E'we gives the following additions to his list of 1918 (See YEAR BOOK, 1918, 206):

Commercial 'Soft' Coconut Oil Soap	0.326
30% Solution Hydrogen Dioxide	0.356
Silver Nitrate	.7744.
Mercury Cyanide	102.
Mercury Oxycyanide	166.
Mercuric Chloride	584.
Quinine and Urea Hydrochloride	.054
Commercial Soap of Borax and Naphtha Variety	.3375
Commercial Hard Unperfumed Toilet Soap	.275
Anhydrous Oxalic Acid	14.4
Mixture of 100 parts of 40% Formaldehyde Solution and 25 parts Anhydrous Oxalic Acid	11.98
40% Formaldehyde Solution	.62
Salicylic Acid	14.71
Water-soluble Sulphonated Hydrocarbon	.46
10% Solution Sodium Hydroxide	1.27
Oxalic Acid, crystal (6 samples)	9.85 to 11.26
Sodium Oxalate (2 samples)	Practically Zero
Iodized Vegetable Oil (5% total iodine)	Practically Zero
Commercial Ammonium Ichthyol-Sulphonates (2 samples)	Practically Zero

—Proc. Penna. Pharm. Assoc., 45 (1920), 248. (L. S.)

Phenol Coefficients.—*Determination in Substances Immiscible with Water or Culture Media.*—It is essential that the substance being tested be miscible with water or the culture medium used.

Variable results obtained for oily substances are due to this. Constant coefficients are possible if the oily material be emulsified. George E. E'we gives the following formula:

"Place the oily substance in a mortar and to each mil of it add 1 gramme of powdered acacia. Triturate together until a homogeneous mass results. Add water in small volumes, triturating after each addition, so as to maintain a homogeneous mixture. Finally wash the contents of the mortar into a volumetric flask and bring up to the required volume. The following proportions have proven convenient:

Oily substance	1 part
Gum acacia	1 part
Water, to make	10 parts"

This makes a stable emulsion which can be diluted. In a few cases the following modifications proved better:

"Triturate one part of powdered acacia and one part of water in a mortar until a perfect mucilage results. Incorporate one part of the oily substance, then add water in small portions, triturating after each addition. Wash the contents of the mortar into a volumetric flask and bring up to 10 parts with water."

Still another method which gives figures a little higher has been tried.

"Dissolve 40 grammes rosin in 100 grammes of the oily substance by aid of a little heat with stirring; add 20 grammes of a 25 per cent solution of sodium hydroxide, stir well, allow to cool and measure to obtain relation between the total volume of the mixture and the 100 grammes of oily substance employed in making the mixture."—J. Am. Pharm. Assoc., 9 (1920), 48. (Z. M. C.)

Phenyl Arsenous Compounds.—*Iodometric Assay of.*—For the estimation of each component in a mixture of arsenous, phenylarsine, and diphenylarsine chlorides and triphenylarsine P. Fleury dissolves a known amount of the mixture in benzene, and then extracts the solution with aqueous sodium hydroxide. The extract, which contains the arsenous acid, and phenylarsine oxide, is acidified with hydrochloric and until the acidity is approximately N/10; an equal volume of alcohol is added, and the mixture is titrated with standard iodine. This titration gives the amount of phenylarsine chloride present in

the original mixture. An excess of sodium bicarbonate is added, and the titration continued till the second end-point is reached. The additional iodine required is equivalent to the arsenous chloride originally present. The benzene solution left after the extraction is titrated with standard iodine, the amount required being equivalent to the diphenylarsine chloride and triphenylarsine originally present. To the liquid resulting from the titration excess of aqueous sodium bicarbonate is added, and the liquid is extracted with chloroform. The extract contains the triphenylarsine oxide, and if the aqueous solution is acidified and again extracted with chloroform the second extract will contain the diphenylarsenic acid, which may be obtained in a crystalline form on evaporation of the solvent.—Bull. Soc. Chim., through J. Soc. Chem. Ind., 39 (1920), 638A.

Well-Known Remedies.—*New Therapeutic Uses for.*—E. F. Cook gives a brief summary of the uses of benzyl benzoate, as well as a prescription for its administration for dysmenorrhea. Macht discovered in the course of his investigation of benzyl combinations that benzyl alcohol had marked anesthetic action when applied to the tongue, being similar to the action of cocaine, the numbness lasting over two hours. Solutions of benzyl alcohol can be made up to four per cent. preferably in physiological salt solution and possess the great advantage of sterilization by boiling without decomposition or loss of the benzyl alcohol.

Zinc chloride in solution has been reported by Dr. Wm. Wayne Babcock, Lieutenant-Colonel in the Medical Corps of the U. S. Army, as having been very successful in the treatment of chronic infected wounds of soft tissue and of bone involvement. A rather complete description of the technic for its application is given.—Am. J. Pharm., 92 (1920), 13. (J. K. T.)

HYDROCARBONS.

Acetylene.—*Production of Acetaldehyde from.*—Neumann and Schneider finds that for the conversion of acetylene into acetaldehyde on the laboratory scale the best results were obtained by leading the gas with vigorous mechanical stirring into 96 per cent acetic acid containing 3 per cent of mercuric sulphate in solution, the temperature being maintained at about 30°. Under these conditions nearly 90 per cent of the theoretical yield was obtained. At

40° to 50° the rate absorption was actually greater, but the percentage yield of acetaldehyde was reduced to 70 to 80 per cent. Using a dilute sulphuric acid medium instead of acetic acid the reaction was more erratic, and under favorable circumstances only 70 to 75 per cent yields were obtained. The best results in the direct conversion of acetylene to acetic acid were obtained by using the above mercuric sulphate-acetic acid catalyst with the addition of vanadium pentoxide, acetylene and oxygen being led in alternately. Yields of acetic acid up to 83 per cent were obtained.—J. Soc. Chem. Ind., 39 (1920), 639A.

Acetylene.—*Reaction with Ozone.*—Wohl and Bräunig find that when acetylene and ozone are mixed a violent explosion occurs unless the gaseous mixture is diluted with air or with steam. The products of the reaction are formic acid and glyoxal. From the latter can be prepared anilinoacetic acid, which is now used in the production of indigo.—Chem. Ztg., through J. pharm. chim., 22 (1920), 113.

Acetylene.—*Uses of Chlorinated.*—R. Fabre presents a descriptive article discussing the manufacture and uses of the following bodies, all of which can be prepared by the chlorination of acetylene:

Name	Formula	Boiling Point	Density
Dichlor ethylene	$C_2H_2Cl_2$	55°	1.25
Trichlor ethylene	$C_2H\,Cl_3$	88°	1.47
Perchlor ethylene	C_2Cl_4	121°	1.62
Tetrachlor ethane	$C_2H_2Cl_4$	147°	1.60
Pentachlor ethane	$C_2H\,Cl_5$	159°	1.70
Hexachlor ethane	C_2Cl_6	Solid	

The article interestingly describes the uses of these bodies as solvents and as constituents employed in certain organic syntheses.—J. pharm. chim., 21 (1920), 268.

Benzene.—*Assay of Thiophene in.*—A. Meyer precipitates the thiophene by addition of a known excess of a solution of mercuric sulphate and then titrates the excess of mercury with thiocyanate V. S., using ferric alum as indicator.—Compt. rend., through J. pharm. chim., 21 (1920), 327.

Chlorinated Benzenes.—*Aluminum as Catalytic Agent.*—J. Meunier finds that aluminum in even as small amounts as 1 part in 1000 acts as efficiently as a catalytic agent in the chlorination of benzenes as aluminum chloride does in the Friedel-Craft reaction.—Compt. rend., through J. pharm. chim., 22 (1920), 358.

Ethylene.—*Chlorination in the Presence of Calcium Chloride.*—J. A. Smyth finds that ethylene and chlorine react very readily in the presence of calcium chloride. A mixed product, containing 50 to 60 per cent of ethylene dichloride is obtained. Much heat is disengaged, and the apparatus should be cooled during the operation. The products are purified by fractionation. The chlorinated product contains, on the average, 50 per cent of dichloroethane, 25 per cent of trichloroethane, and 25 per cent of higher-boiling products. The calcium chloride apparently acts as a catalyst, but its activity may be due to the presence of a small amount of iron (1 in 50,000 estimated colorimetrically).—Gas J., through J. Soc. Chem. Ind., through 39 (1920), 312A.

Heptane.—*Chemistry of Its Solution.*—Edward Kremers directs attention to the growing interest in this hydrocarbon among phytochemists. It has been found in Digger's pine, *Pinus sabiniana*, the Jeffrey pine, *Pinus Jeffreyi*, and the fruits (petroleum nuts) of *Pittosporum resiniferum*. Experiments have shown that heptane has advantages over xylene in moisture determinations and being highly selective it may also reveal other constituents. In working with squill, beautiful crystals were obtained from the residual heptane. In studying the constituents dissolved from alkaloidal drugs, it was found desirable to use alkaloidal reagents in heptane solutions. The value of heptane as a solvent is threefold: It is a saturated hydrocarbon of the limit series; it is free from isomeres and homologues and is easily purified; it is volatile and has a boiling point close to that of water and only twenty degrees higher than that of alcohol, the most common organic solvent.—J. Am. Pharm. Assoc., 9 (1920), 857. (Z. M. C.)

Edward Kremers and Roland E. Kremers report some revision of the physical constants of heptane. Fifteen five-gallon lots of oleoresin were distilled and the amount of each with its specific gravity is reported. The mixed distillates were fractionated by steam and the specific gravity of each was determined. Several fractions were purified by three treatments with sulphuric acid fol-

lowed by sodium carbonate. They were next treated with potassium permanganate and later distilled. Specific gravity, optical rotation, refractive index, boiling point and surface tension were determined. —J. Am. Pharm. Assoc., 9 (1920), 860. (Z. M. C.)

E. Kremers and D. C. L. Sherk discuss the physical constants of the purified heptane. For the boiling point a constant pressure apparatus was used and distillates were collected for each 0.05° rise in temperature. Results are tabulated for samples purified by iodine, hydrogen iodide, hydrogen chloride, antimony trichloride, bromine and hydrogen bromide. Density was very carefully determined and detailed procedure is given, together with a table of comparative density of the specimens purified by different substances. Refractive index of each was measured by the Pulfrich refractometer. Viscosity was determined by Ostwald's method.— J. Am. Pharm. Assoc., 9 (1920), 1153. (Z. M. C.)

Naphthalene.—*Amino Derivatives of.*—A. Madinaveita reports on physiological tests with amines of similar constitution to adrenaline but containing a naphthalene instead of a benzene nucleus, showing that a naphthalene compound is 40 times more active than a benzene one, and that introduction of a hydroxyl in the nucleus increases the physiological action of the compound.—Anal. Fis. Quim., through J. Soc. Chem. Ind., 39 (1920), 526A.

Natalite.—*A New Motor Fuel.*—It is reported by the London Automobile Association and the daily press that natalite, the new motor fuel (so called by reason of its discovery in Natal, South Africa), has been in use in that country for some time past, is well spoken of, and has had many favorable reports upon its practicability as a gasoline substitute. It is said to be a by-product of the Natal sugar industry, and is reported to be a mixture of power alcohol and ether, capable of great development, in view of the large tracts of waste vegetation available in South Africa. A British research committee is now engaged in making regulations respecting the use of this fuel, especially the necessity of denaturing the liquid to prevent its possible use as an intoxicant.—Pract. Drug., 39 (Oct., 1920), 36.

Nitrobenzene.—*Poisoning by.*—K. Bohland cites a case where the head of a 13-year old girl had been rubbed with an anti-lice remedy called "Parasitengeist," which contained nitrobenzene. He

further calls attention to the danger of substituting oil of bitter almonds by nitrobenzene in the manufacture of cordials, lemonades and pastry.—Dtsch. Med. Wsch., through Pharm. Weekblad, 57 (1920), 409. (H. E.)

Paraffin.—*Fatty Acids from.*—K. Löffl reports that in the catalytic oxidation of petroleum hydrocarbons the best yields of fatty acids are obtained with lead or mercuric compounds, which apparently dissolve completely in the products of oxidation. The best results are obtained by oxidizing at 115° to 120° under a pressure of 3 atmospheres and with agitation for about 7 hours in the presence of water, which is an essential factor. Alkalies have not the catalytic influence claimed by Schaal and by Franck. The oxidation products (98 to 120 per cent; av. 106 to 110 per cent on the original material) consist of about 7 to 20 per cent of water, 25 to 40 per cent of lower fatty acids, with small amounts of aliphatic aldehydes and ketones, and 78 to 50 per cent of higher fatty acids and 10 to 15 per cent of unsaponifiable matter. They may be fractionated by distillation (up to 200°) with superheated steam and then by distillation with steam in *vacuo*. The unsaponifiable hydrocarbons may be separated by fractional precipitation with alcohol, alcohol-ether, and alcohol-ethyl acetate. The fatty acids mixed with 10 to 20 per cent of tallow or coconut oil fatty acids yield satisfactory soaps.—Chem. Ztg., through J. Soc. Chem. Ind., 39 (1920), 606A.

Paraffin.—*Products Obtained by "Cracking"*—H. Franck heated 500 grammes of paraffin (M. P. 52° to 53°, iodine number, 0) in a pressure autoclave provided with a stirrer and with entrance tube for oxygen and exit tube for reaction gases, to 150° using lead as catalyzer. From this treatment resulted a paraffin melting at 44° to 46° and having an iodine number of about 8, and 460 grammes of mixture of fatty acids running from acetic to stearic acid.—Chem. Ztg., through J. pharm. chim., 22 (1920), 111.

Paraffin Wax.—*Occurrence in Lancashire Coal.*—Sinnatt and Barash reports that a deposit of several tons weight was found over 30 years ago in the Arley mine at a depth of 440 yards. This consisted of a dark brown, brittle, tasteless, and odorless wax. It contains no sulphur, nitrogen, ash, nor halogens, and is practically insoluble in all solvents in the cold, but dissolves in hot benzene,

toluene, chloroform, carbon tetrachloride, and aniline. The wax is unaffected by strong alkalies and acids, except by hot concentrated sulphuric acid. Hot liquid bromine has no action on the wax. On bleaching a hot benzene solution with animal charcoal, a white amorphous solid was produced, melting point 93.0° and solidification point 92.7°. Under 15 mm. pressure the wax boiled at 420° to 422°, and about 85 per cent distilled without decomposition. The specific gravity is 0.9422 when cold and 0.7940 at the melting point. The substance is pentacontane, $C_{50}H_{102}$, and is the highest homologue of the paraffin series so far discovered occurring naturally. —Inst. Min. Eng., through J. Soc. Chem. Ind., 139 (1920), 289A.

Petroleum.—*Deodorizing.*—One of the simplest methods of deodorizing petroleum consists in shaking vigorously 100 grammes chlorinated lime with 4.5 liters of petroleum, and then adding some unslacked lime to absorb the excess chlorine. The liquid is allowed to settle and is then decanted.—L'Union Pharm., through Am. Drug., 68 (April, 1920), 60.

Petroleum.—*Greek.*—The United States consul at Salonica reports the discovery of an oil field where certain wells yield as much as 50 barrels a day.—Comm. Rept., through J. pharm. chim. 22 (1920), 285.

Petroleum.—*Origin of.*—Engler's theory of the origin of coal oil is that animal and vegetable fats were first saponified in water, and that the resulting fatty acids were decomposed by combined heat and pressure into carbon dioxide and hydrocarbons. This theory seems to be true to some extent, as Pictet and Potok have shown by the following experiments. When sodium stearate is distilled at 13 to 15 mm. pressure, liquid and solid hydrocarbons of the general formula $C^n H_{(2n+2)}$ are formed, chiefly among them $C_{10}H_{22}$, $C_{14}H_{30}$, $C_{15}H_{32}$ and $C_{34}H_{70}$. These hydrocarbons constitute a large percentage of Pennsylvania coal oil. Sodium oleate furnishes under the same conditions a series of unsaturated hydrocarbons of the general formula C_nH_{2n}, especially C_6H_{12}, $C_{10}H_{20}$, $C_{11}H_{22}$ and $C_{13}H_{26}$ products which are present in a number of coal oils of American origin. Since, however, coal oil contains naphthalin derivatives, either a condensation of these hydrocarbons must have taken place or substances other than fats must have been sub-

jected to destructive distillation under pressure in the formation of coal oil.—Helv. Chim. Acta, through Drug. Circ., 64 (1920), 180.

Petroleum.—*Papuan.*—Read and Andrews give the following information on "170° run" of Papuan oil. It contains 11 per cent. of aromatic hydrocarbons from which a fraction having a combined content of benzene and toluene amounting to about 10 per cent, has been taken.

The crude oil had sp. gr. 0.7965 at 22° C. and $N_D^{20} =$

They distilled the oil under reduced pressure and isolated the following from different fractions, normal tricosane, normal pentacosane and normal heptacosane.—J. Soc. Chem. Ind., 39 (1920), 289T. (J. M. W.)

Petroleum.—*The Nitrogenous Bases in Californian.*—Mabery and Wesson conclude as a result of their researches that the bases isolated from California petroleum consist mainly of alkylated quinolines, or isoquinolines.—J. Am. Chem. Soc. 42 (1920), 1014. (J. L. M.)

Gasoline.—*Substitutes for.*—The efficiency of a mixture of equal parts of alcohol and benzol compared to that of gasoline has been found to be as 12.5 to 15.0; addition of ammonium nitrate to the mixture overcoming the effect of the mixture upon the pistons. —Chem. & Drug., 92 (1920), 790. (K. S. B.)

Liquid Petrolatum.—*Testing for Impurities.*—This fluid when used as a vehicle for injections has caused poisoning, due to its being impure. Most samples examined had too low a specific gravity and turned black with sulphuric acid on a water bath. To test for fatty oil, heat 3 or 4 mils for 15 minutes at 240° with a piece of sodium hydroxide. On cooking, formation of a jelly or foam indicates soap. Fluorescence is shown by a light blue color when a drop is placed on a black lacquered surface. In absence of fluorescence the drop appears black. Nitronaphthalene, $C_{10}H_7NO_2$, likely to be added to counteract fluorescence is extracted with alcohol, forming long yellow needles upon concentration.—Schweiz. Apoth. Ztg., 58 (1920), 327. (H. A. L.)

Petrolatum.—*Analysis of.*—Armanni and Rodano have devised a method for distinguishing between the natural and artificial petro-

latums based upon the difference in the solubility of the two substances in a mixture of benzene and absolute alcohol (equal parts). One part of vaseline is dissolved in 20 parts of hot solvent and the mixture allowed to stand for 24 hours in a cold place. If the petrolatum is natural there will only be a slight oily deposit, while an artificial vaseline shows a flocculent or crystalline deposit resembling paraffin wax. In a mixture of the two petroleums the amount of precipitate is proportional to the quantity of artificial petrolatum present and the method will detect less than 20 per cent. of the latter.—Am. J. Pharm., 92 (1920), 52. (J. K. T.)

Ichthyol and Its Substitutes.—At the 1920 meeting of the New York State Pharmaceutical Association, W. J. Thompson reported on the sulphur content of ichthyol and its substitutes as found by him in his analyses of these bodies. His figures are:

Ichthyol	10.93%	Ichthiogau	6.22%
Ichthynat	8.35%	Japanese Ichthyol	6.39%
Saurolo	6.96%	Ichthyol substitute	6.90%
Ichthyosulfol	7.08%	Ammonium sulphonichthyolate	5.56%
Kremichtho	6.02%	Petromyzol	7.51%
Ichthium	6.83%	Hirathiol	5.36%
Ichtosan	6.74%	Ittiolo	7.87%
Ichthyol Sub. No. 1	9.12%	American Ichthyol	4.51%
Ichthyol Sub. No. 2	6.95%		
Isarol	5.85%		

—Proc. N. Y. S. Pharm. Assoc., 42 (1920), 198.

Sulphurated Tar Oils.—*Constituents of.*—H. Scheibler working on crude ichthyol oils and other tarry distillates from bituminous shales, has been able to isolate the active sulphur compounds free from the resinous products found in commercial sulphonated tars. These active bodies, he finds, are thiophene derivatives.—Arch. Pharm., through Pharm. Ztg., 65 (1920), 443.

Tetralin.—*A New Solvent.*—Three forms of this solvent have appeared in the German market: (a) Tetra hydronaphthalin $C_{10}H_{12}$; (b) Deka hydronaphthalin, $C_{10}H_{18}$; and (c) tetralin essence, a liquid boiling below 190°. The contrasts for "a" and "b" are:

	Tetra hydro-naphthalin	Deka hydro-naphthalin
Specific gravity (15°)	0.970-0.980	0.890-0.900
Boiling point	205-207°	185-195°
Flash point	78°	60°

These solvents are now used largely in the varnish industry, and H. Kantorowicz discusses the possibility of their use in pharmacy and in chemistry, notably in alkaloidal extractions.—Seifenfab., through Pharm. Ztg., 65 (1920), 444.

Tetralin.—*Poisonous Character of.*—Lewin discusses this substance which is now largely used in the varnish industry as a solvent for resins. It consists of dekahydronaphthalin (B. P. 185° to 195°) or tetrahydronaphthalin, the latter being in fact an orthoxylol derivate as one of the naphthalin rings is split during the process of hydration. Lewin points out that tetralin vapors are distinctly poisonous and in his paper describes the toxic symptoms.—Z. dtsch. Oel-Fett-Ind., through Pharm. Zent., 61 (1920), 624.

Toluene.—*Derivatives of.*—G. Chazel describes the manufacture of benzyl chloride, $C_6H_5CH_2Cl$, which was used as a lachrymatory gas during the war. He also points out that from it can be prepared phenyl ethyl alcohol, the basis of many synthetic perfumes. —Rev. Prod. Chim., through Schweiz. Apoth. Ztg., 53 (1920), 607.

Xylol.—*Use in Tuberculosis.*—G. Volpino reports that guinea-pigs treated with hypodermic injections of 0.5 to 1 mil of xylol for fifteen days, the first injection being given eight days after the animals were inoculated with tuberculosis sputum, were found subsequently to develop only slight and limited infection, whereas the control animals, without the xylol injections, had serious and diffuse tuberculous lesions. All three of the isomeric xylols are equally efficacious; their toxicity is but slight. Among other methyl derivatives of benzene, cymene has more marked anti-tubercular action than xylol. The hydrocarbons of the terpene series are less active. It seems that these substances act by stimulating phagocytosis. *In vitro* xylol shows only moderate bactericidal properties. After twenty-four hours' contact, it modifies the virulence of tuberculous

cultures, sometimes it even sterilizes them. Patients with tubercular affections of the bones and joints have received great benefit and have even been cured by injections of 0.5 to 1.0 mil of xylol at eight days' interval; but the consecutive reactions are so violent that this method of treatment has been abandoned. Oily dilutions of 1:5 or 1:10 have been substituted, and are better tolerated. They seem to give good therapeutic results.—Am. Inst. Pasteur, through Pharm. J., 104 (1920), 171.

VOLATILE OILS AND DERIVATIVES.

Volatile Oils.—*Determination of the Separation Temperature of.* —J. J. Hofman found that by the estimation of the separation temperature of essential oils with alcohol of different strength the purity of the oils can be determined. Thus one part of cherry laurel oil should form a clear solution with 4 parts of 50 per cent alcohol at 21°. At 54° one part of cinnamon oil is soluble in 4 parts of 60 per cent alcohol, at 18° oil of cloves, at 51° oil of lavender, and at 69° oil of peppermint. When 70 per cent. alcohol is used one part of oil of cajuput is soluble in 4 parts of this alcohol at 61°, santal oil at 20° and mustard oil at 43°. One part of oil of anise dissolves in 4 parts of 80 per cent. alcohol at 51°, oil of fennel at 38°, oil of mace at 68°, and oil of rosemary at 26°. One part of oil of orange is soluble in 4 parts of 90 per cent. alcohol at 56°, oil of lemon at 59°, and oil of turpentine at 60°. The estimations were carried out by warming the mixtures above the separation temperature and then cooling and observing at what temperature the mixture appeared red in transmitted light and blue in reflected light and when a turbidity was produced. Experiments on the application of this method especially to the terpeneless oils and to adulterations of oils are under way.—Pharm. Weekbl., 57 (1920), 651. (H. E.)

Volatile Oils.—*Physiological and Biological Importance of.*— Although we do not know what physiological and biological importance must be ascribed to volatile oils and flower scents, some ideas have been expressed on the subject; but in the main they have been found to be erroneous. Regarding the supposition that volatile oils protect plants from animal attacks, or from too great loss of temperature at night, from excessive evaporation during the day, or

that the strong odor attracts insects, etc., K. von Frisch concludes from his own investigations that neither the scent nor the color of the plants can be regarded as an enticement, but rather as a guidance. The scent of a bush in full bloom or of a whole field of sweet-smelling flowers may attract bees from a distance, especially when the wind is favorable, but the determining factor is not the odor of the plants, but the color. Notwithstanding this generalization, von Frisch outlines several experiments which showed that bees are capable of making a fine distinction between various odors. In spite of the fact that the behavior of the bees varies with different scents, and that the direction of the wind is not without effect in this matter, it would seem that both scent and color have a combined effect.—Schimmel's Rept., through Pharm. Era, 53 (1920), 334.

Volatile Oils.—*Preservation of.*—Volatile oils which resinify and assume a turpentine odor, can be kept indefinitely by adding sodium bisulphite in the proportion of 50 grains to 1 pound.—Pract. Drug., 39 (1920), 36.

Volatile Oils.—*Refractive Index and Optical Rotation of Commercial.*—Azor Thurston gives these constants for about forty oils. They are often of importance in determining adulteration when considered along with other constants.—J. Am. Pharm. Assoc., 9 (1920), 38. (Z. M. C.)

Volatile Oils.—*Solubility in Mixtures of Alcohol and Water.*—H. C. Wood has tested five oils and reports some points of interest. He gives details of procedure and tabulates results. Clove oil, it is interesting to note, requires 200 parts of 50 per cent. alcohol for solution, but eugenol, which make up 82 per cent. of the oil is soluble in less than 20 parts of 50 per cent. alcohol. Some statements of solubility in the U. S. Pharmacopœia and the British Pharmacopœia need correction. On the whole, relatively concentrated alcohol is not a good solvent for volatile oils, contrary to the frequent assumption that 70 per cent. alcohol dissolves the majority of them.—J. Am. Pharm. Assoc., 9 (1920), 878. (Z. M. C.)

Volumetric Oils.—*Structural Relations of Constituents of.*—Ingo W. D. Hackh outlines the structural relation existing among the volatile oils and illustrates the advantage of structure symbols.

In the main they are geometrical devices which eliminate customary symbols of C, H, O, and N, these elements being represented by points from which one, two, three or four lines radiate. More than 150 compounds are illustrated and listed in perhaps one-tenth the space that would otherwise be required. A thorough understanding of the system demands a study of the paper itself together with the plates, especially the one giving the key, the seven most important types of organic compounds, hydrocarbons, alcohols, ethers, aldehydes, ketones, acids and esters, and the four classes, saturated and unsaturated aliphatic compounds and saturated and unsaturated aromatic compounds.—J. Am. Pharm. Assoc., 9 (1920), 948. (Z. M. C.)

Oil of Anise.—*Use in Itch.*—The favorable results obtained with essential oils in the treatment of lice infested clothes have led to experiments being carried out as regards the treatment of itch. It was found that for this complaint the best remedy was anise oil. A. Parutz recommends application of the oil in the form of an ointment (oil of anise 1.0, petrolatum, to make 100.0). Patients should rub the ointment all over the body, more especially into the places exposed to itch, such as the inner side of the joints, between the fingers, in the armpits, around the sacrum, etc. Even after the first inunction the itching sensation is said to cease, after four inunctions the subjective symptoms disappear and the cure is complete. It is, however, advisable that a fifth application of the ointment should be made. A warm bath the day after every treatment is indicated. —Schimmel's Rept., through Am. Drug., 68 (Apr., 1920), 14.

Oil of Artemisia Annua.—*Artemisia Ketone from.*—Asahina and Takagi have found that this ketone contains an isomere, and some constants, given previously, therefore need correction. When oxidized with potassium dichromate and sulphuric acid or concentrated nitric acid, tetrahydro-artemisia-ketone yielded acetone (?), acetic acid, and dimethylethylacetic acid, whilst artemisia-ketone yielded dimethylmalonic acid when oxidized with potassium permanganate. By evaporating, *in vacuo*, the mother liquor, from which artemisia-ketone-semicarbazone was isolated, a new ketone was obtained as its semicarbazone compound, m.p. 70° to 72°. The free ketone, isoartemisia-ketone, $C_{10}H_{16}O$, b.p. 182°—183°C., sp. gr. 0.8711 at 17°/4° C., $n^{17}_D = 1.46880$, resembles artemisia-ketone

in its physical properties, but does not give a semicarbazone. It is converted into tetrahydro-artesimia-ketone when reduced with hydrogen in the presence of platinum-black, and is considered to be an $\alpha\beta$-unsaturated compound. Artemisia-ketone is converted into the iso-compound by heating with 5 per cent. alcoholic sulphuric acid. The content of the iso-ketone in *Artemisia annua* oil is about 10 per cent. The formulæ

$CH_2:CH.C(CH_3)_2.CO.CH_2.C(CH_3):CH_2$ and
$CH_2:CH.C(CH_3)_2.CO.CH:C(CH_3)_2$

are given for artemisia-ketone and iso-artemisia-ketone respectively. —J. Pharm. Soc. Japan, through J. Soc. Chem. Ind., 39 (1920), 832A.

Oil of Artemisia Glutinosa.—*Properties of.*—C. T. Bennett reports on this oil, produced in Spain, as follows: Odor fragrant and aromatic, recalling that of a mixture of sage, rosemary, and spike lavender, the odor of borneol predominating; sp. gr., 0.937; rotation, + 24°; n^{20}_D 1.4780; total alcohols as borneol, 17.5 per cent.; esters as bornyl acetate, 6.3 per cent.; phenols, 8 per cent.; aldehydes and ketones, 18 per cent.; distillation, 52 per cent. between 175° and 200°. The phenol is probably methylchavicol. The presence of thujone could not be established, but a small quantity of a fragrant aldehyde was isolated.—Perf. Essent. Oil Rec., through J. Soc. Chem. Ind., 39 (1920), 674A.

Camphor.—*Assay of Camphor Oil in.*—E. R. Dovey determines the amount of camphor oil present in Chinese crude camphor by submitting a 100 gramme portion to pressure in a steel press, and from the weight of the pressed cake the loss of water and oil is obtained. The moisture is determined on the original sample and also on the pressed cake by the calcium carbide or other method, and by difference the weight of water lost in pressing is found. This subtracted from the total liquid expressed gives the amount of oil expressed. It is assumed that the water remaining in the sample is associated with as much oil as that in the expressed liquid, and the total oil present calculated on that basis.—Perf. Ess. Oil J., through Pharm. Era, 53 (1920), 210.

Camphor.—*Dose of.*—E. Cabannes is of opinion that it is time that the accepted posology of camphor should be revised.

Camphor is prescribed much more widely in France than in this country. During the recent epidemics of influenza and pneumonia in that country its use has extended and its dose greatly increased. At one time the quantity given by injection of camphorated oil was limited to a maximum of 0.5 gramme administered in several separate doses. Then surgeons increased the dose to 2 or 3 grammes per diem in cases of threatened heart failure, and physicians continued to prescribe it widely and in even larger doses, up to 3 or even 4 or 5 grammes in twenty-four hours. The normal single dose for an adult may be taken to be 0.5 to 1 gramme, or 3 grammes in twenty-four hours, which may be increased, if necessary. Consequently pharmacists may dispense, without hesitation, what were formerly considered to be excessive doses of sterilized camphorated oil for injection.—Bull. Soc. Pharm. Bordeaux, through Pharm. J., 104 (1920), 28.

Synthetic Camphor.—*Manufacture of.*—Mailhe states that synthetic camphor is prepared quite simply in three steps from the pinene of oil of turpentine. Gaseous hydrochloric acid converts the pinene into a solid hydrochloride, and this is changed to camphene by ammonia, pyridine, or any one of many methods. The camphene is hydrated into borneol by heating in a water-bath with glacial acetic acid and about two per cent. of sulphuric acid. The borneol is transformed into camphor by oxidation by air, oxygen, ozone, or other agent; or by dehydrogenation by passing the borneol vapor over finely divided copper heated to 300° to 330°, thus splitting the compound up into hydrogen and camphor. The success of this artificial camphor may depend on a lowering of the present high cost of turpentine and hydrochloric acid.—Pharm. Era, 53 (1920), 269.

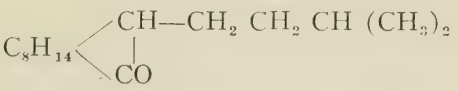
Synthetic Camphor.—*Pharmacological Comparison with the Natural Product.*—After describing synthetic camphor, its manufacture and its test for distinction from natural camphor (which gives color reactions with vanillin-hydrochloric acid, while synthetic camphor does not) P. Borisch discusses the therapeutics of the two forms, citing Langgaard and Maass, Kobert, Bachem, Joachimoglu, Leyden and von den Velden, Hilber and Lutz, as finding that the therapeutic action of synthetic camphor adminis-

tered externally, per os, subcutaneously and intravenously, is the same as that of the natural.

Levy and Wolff sound a warning that the dose of synthetic camphor should be less than that of the natural product, since the synthetic is a mixture of dextrogyrate (natural camphor) and levogyrate $C_{10}H_{16}O$ and that Pari has found that levogyrate variety thirteen times more poisonous than the natural product. Borisch states in answer to this criticism that Joachimoglu has reported that levogyrate camphor is no more poisonous than natural camphor.—Pharm. Zent., 61 (1920), 403.

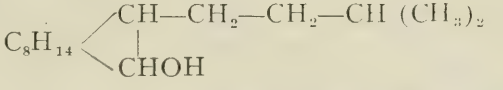
Isoamyl Camphor.—*Preparation of.*—F. Martin by employment of a temperature of 140°, obtained by the action of sodium isoamylate in excess of amyl alcohol, upon camphor a mixture, which upon oxidation, with permanganate yielded isoamyl camphor and by reduction with nascent hydrogen yielded isoamyl camphol. The substances obtained in the research were:

1. *Isoamyl camphor,*



oily straw-colored liquid; density at 15°, 0.9272; boiling point at 33 mm., 165°; optical rotation in absolute alcohol at 18°, + 58° to 59° 22¹.

2. *Isoamyl camphol,*



white, greasy solid, melting at 25° to 31°; density at 0°, 0.9611; boiling point at 61 mm., 190°; optical rotation in absolute alcohol at 21°, + 16° 55¹ to + 17° 3¹.

3. *Acetylisoamyl camphol,* viscous liquid, density at 15°, 0.9402; boiling point at 30 mm., 169-170°; optical rotation at 18° in absolute alcohol, + 7° 24¹.

4. *Phenylurethane of isoamyl camphol,* white crystalline solid.—J. pharm. chim. 21 (1920), 417.

Oil of Caraway.—*Carvone Assay of.*—L. Lautenschläger gives the following method: One gramme of caraway oil is refluxed for five hours with 50 mils of an alcoholic N/10 hydrazide solution. The alcohol is distilled off, the residue is treated with water and then filtered. The filter is washed with water until a total volume of 250 mils of clear solution is obtained. Of this solution 25 mils are mixed with 50 mils of N/10 iodine solution and a small amount of caustic soda solution. After acidulating the liquid, the iodine is titrated with N/10 sodium thiosulphate solution. If the oil contains 99.75 per cent of carvon, 13.3 mils of thiosulphate solution should be consumed.—Pharm. Weekbl., 57 (1920), 892. (H. E.)

Carvacrol.—*Production of.*—Gibbs and Phillips report as the result of a series of experiments on alkali fusions, that carvacrol may be produced in amounts as high as 75 per cent. when paracymene sulphonate and sodium hydroxide are fused together under properly controlled conditions. It appears that the highest yield of carvacrol is obtained when the fusion is conducted at 350° in an autoclave, for 6 hours.—J. Ind. Eng. Chem., 12 (1920), 145. (L. A. B.)

Oil of Cassia.—*Rapid Determination of Lead in.*—O. F. Lubatti states that as cassia oil exported from China is contaminated with lead that it is necessary to have a reliable method for determining the same. He then suggests the following method:

Five mils of oil are diluted to 20 mils with 90 per cent. alcohol, 5 or 2.5 mils of this solution are pipetted into a 50 mil Nessler cylinder (2.5 cm.) and diluted to 20 mils with 90 per cent. alcohol. A blank from lead-free cassia oil (by distilling) is prepared in similar way. Add 1 mil of ammonium sulphide solution to both tubes and standard alcoholic lead solution (1 mil=0.0001 gramme Pb.) is added to the blank until the brown coloration produced matches the sample under examination. The results are calculated using $X=\frac{n\times 0.04}{m}$; "X" is percentage of lead sought, "n" the number of mils of standard lead solution used and "m" is the amount of original solution taken.

This method show results 0.00018 gramme too high; therefore more accurate results are obtained by subtracting this amount from results found.—J. Soc. Chem. Ind., 39 (1920), 35T. (J. M.W.)

Oil of Chenopodium.—*Poisoning by.*—H. Bruening cites 25 cases of poisoning by oil of chenopodium of which about one-half were fatal. He ascribes these unfortunate cases to the use of sophisticated oil imported from U. S. Some samples did not contain any oil of chenopodium at all, but were mixtures of oil of eucalyptus, oil of anise and amyl acetate.—Med. Klin., through Pharm. Weekbl., 57 (1920), 336. (H. E.)

Oil of Cinnamon.—*Assay of.*—L. Lautenschläger distills 10 grammes of the bark with steam until no more oil passes over. The distillate is treated with 50 mils of normal hydrazine sulphate, is allowed to stand five hours after which it is filtered. The filtrate is diluted with water to 500 mils and to 50 mils of the fluid is added 50 mils of tenth-normal iodine and a little sodium hydroxide, after which it is titrated with tenth-normal thiosulphate. Not more than 1.1 mil of the thiosulphate solution (corresponding to 0.72 per cent. cinnamic aldehyde.), should be required to decolorize the residual iodine. Lautenschläger also applies the foregoing hydrazine, iodine, thiosulphate assay to the cinnamic aldehyde assay of oil of cinnamon.—Arch. Pharm., through Pharm. Zent., 61 (1920), 130.

Eucalyptol Assays.—T. T. Cocking determines cineol (eucalyptol) cryoscopically by repeated freezing and melting 3 grammes of mixtures containing respectively 95, 90, 85, 80, 75, 70, 65, 60, 55, 50 and 40 per cent. of cineol by weight in terebene with 2.1 grammes of melted orthocresol. Similar series of experiments were carried out on mixtures of cineol with a sesquiterpene (using oil of copaiba for the latter). The results of the above experiments together with those of similar experiments including a comparison with the phosphoric acid process are given in the resumé by the author.—Pharm. J. 105 (1920), 81. (F. H.)

Bennett and Salamon find that the Cocking cresol method is no more reliable than the official phosphoric acid method for the estimation of eucalyptol, as the constituents of eucalyptus oil other than eucalyptol have a marked influence on the melting point of the cresol compound.—Perf. Essent. Oil Rec., through J. Soc. Chem. Ind., 39 (1920), 704.

Kleber and Von Rechenberg determine the solidifying point of the oil in a mixture of ice and salt. Since the other constituents of eucalyptus oil are mainly hydrocarbons, the reference curves are obtained by observation of the solidifying temperatures of mixtures of cineol and rectified oil of turpentine; data are given over a range of 100 per cent. to 64 per cent. of cineol. In addition to hydrocarbons, the oil contains minor amounts of alcohols and aldehydes; the former, as exemplified by terpineol appears to raise the solidifying point, which is depressed by aldehydes as instanced by valeraldehyde. The results are accurate to within 1 per cent. The process is not directly applicable to substances, such as cajuput oil, which contains less than 65 per cent. of cineol but may be utilized if a quantity of cineol to the weight of the oil is added.—J. Prakt. Chem., through J. Soc. Chem. Ind., 39 (1920), 763-A.

Oil of Eucalyptus.—*Poisoning by.*—Auerbach reports a case where a man of 47 took 20 mils of oil of eucalyptus. After very serious symptoms the patient recovered after 4 days antidotal treatment, consisting chiefly of the administration of milk and of milk lavage.—Dtsch. med. Wsch., through Am. J. Pharm., 92 (1920), 353.

Oil of Galbanum.—Semmler and Jones report the following constants for an oil of galbanum from which they extracted cadinene; density at 15°, 0.9353; boiling point under 15 mm., 155° to 195°; optical rotation, 8°; refractive index, 1.49395. By fractional distillation of the oil they obtained nine fractions. The first, comprising 29.5 per cent. of the oil, contains a terpene. Fraction 3 contains a ketone, $C_{10}H_{16}O$. It is mixed, as well as fraction 4, with a hydrocarbon, which is cadinene. Fractions 6 and 7 contain a sesquiterpene alcohol, which is cadinol.—Roure-Bertrand's Bull., through Pharm. Era, 53 (1920), 273.

Oils of Gaultheria and Birch.—*Tests for Synthetic Methyl Salicylate in.*—At a meeting of the Philadelphia Branch of the American Pharmaceutical Association, C. H. LaWall discussed the tests proposed by Stanislaus and Semmel, Watson and Sayre and F. C. Umney for the detection of synthetic methyl salicylate in the natural oils. His conclusions are that these color reactions

are only satisfactory with some samples distilled under certain circumstances and that no test has ever been subjected to the searching application of many authentic samples.—Am. J. Phar., 92 (1920), 891.

Oil of Heeria Paniculosa.—C. J. Juritz reports on the examination of a berry received from Zululand somewhat like currants in appearance. They averaged about 7 × 5 mm. in size, of irregularly ovoid shape, having a soft kernel enclosed by a shiny hard crinkly pericarp. The kernel contained a yellowish aromatic substance, sometimes solid and sometimes liquid. The berries were identified as belonging to *Heeria paniculosa* (Anacardiaceæ) a member of the Rhus family. The kernels yielded fixed oil amounting to about 30 per cent. of the entire berries. This was viscous, clear and dark brown having an aromatic odor. Saponification value was 174.1. The amount of crude glycerin yielded was 2.16 per cent. The volatile oil obtained from the pericarp amounted to 5.5 per cent. of the latter. Constants were specific gravity 15/15 C. 0.832; optical rotation α_D +3.75; acid value, 1.6; ester value before acetylation 4.2; ester value after acetylation, 14.8. Results indicate that the oil consists principally of terpenes and having no distinctive odor it is without commercial value. It was found difficult to separate the kernels from pericarp and the removal of the volatile from the fixed oil would be too expensive to allow for commercial use of the latter.—Chem. News, 120 (1920), 277.—(J. H.)

Oil of Juniperus Oxycedrus.—*Chemical Constants of.*—R. Huerre reports on two samples of this oil as follows:

	Milligrammes for 1 gramme of oil
Acid number	0.46 to 1.37
Saponification number	2.9 to 5.0
Acetyl number	39.7 to 40.5

	Grammes in 100 grammes of oil
Alcohols (calculated as terpene alcohols)	10.84 to 11.83
Alcohols (calculated as sesquiterpene alcohols)	15.75 to 16.05

Alcohols extracted with phthalic anhydride, 14 to 12.

Hübl number (maximum), 179.

Pseudo iodine number, 119.

Bromine addition number, 34.8 to 38.

For explanation of the pseudo iodine number, see YEAR BOOK 1919, p. 381.—J. pharm. chim., 21 (1920), 347.

Oil of Lemon.—*Aldehyde Assay of.*—L. Lautenschläger recommends the following:

To three grammes of the oil add 50 mils of normal alcoholic hydrazine solution and heat the mixture, in a flask with upright condenser on a water bath for five hours. Then evaporate the alcohol, add water, filter and dilute the filtrate with enough water to make 250 mils. To 25 mils of this fluid add 50 mils of tenth-normal iodine, a little sodium hydroxide and then after acidulation with diluted sulphuric acid, titrate residual iodine with tenth-normal thiosulphate. Not more than 17.4 mils of thiosulphate solution (representing 4.7 per cent. aldehydes) should be required.—Arch. Pharm., through Pharm. Zent., 61 (1920), 151.

Oil of Melaleuca Leucadendron.—*Properties of.*—*Melaleuca leucadendron,* which produces oil of cajuput, has yielded on distillation of other varieties, two oils very different from that of oil of cajuput, so far as concerns their constants and especially their odor. One of these oils is derived from the broad-leaf variety, and the other from the narrow-leaf variety. Their principal characters are:

	Broad-leaf variety	Narrow-leaf variety
Density at 15°	1.0019	0.9056
Optical rotation	−3° 44	−0° 22
Refractive index at 20°	1.52500	1.47936
Acid value	0.4	0.7
Ester value	7.6	11.8
Ester value after acetylization	15.2	84.8
Soluble in 80% alcohol	0.6 vol.	1.5 vol.

These two oils differ from oil of cajuput in regard to their composition. An essential oil obtained from Annam previously investigated, shows constants approximate to the above, but the oil examined contained 41 per cent. cineol.—Roure-Bertrand's Bull., through Pharm. Era, 53 (1920), 273.

Oil of Mosla Grosseserrata.—*Properties of.*—Y. Murayama reports that three samples of oil from wild plants had the following characters: Sp. gr. 0.9985 at 15°, 0.9543 at 15°, 1.0488 at 19°, saponification value, 33, 23, —; saponification value after acetylation, 66.6, 54.5 —; α_D (1 dm.) = —3.75°, —3.2°, —11.75°; methoxy content, 7.07 per cent., —, 11.38 per cent.; phenol content, 20 per cent., —, —. Thymol, methyleugenol, p-cymol (p-hydroxyisopropylbenzoic acid, m.p. 153°), a terpene, and a sesquiterpene, boiling at 136° at 12 mm. were identified in the first sample, thymoquinol and thymol in the second, and myristicin in the third sample. A sample of oil from the cultivated plant had a dark brown color; sp. gr. at 15°, 0.9006; acid value, 0; saponification value, 37.0; saponification value after acetylation, 49.2; α_D = —4.5°, methoxy content, 34 per cent. Thymoquinol (0.9 per cent.), thymol (13 per cent.), and a terpene were detected in the oil.—J. Soc. Chem. Ind., 39 (1920), 640A.

Oil of Mustard.—*Assay of.*—D. Raquet complains that the editors of the Supplement to the Codex failed to heed his suggestions made some years since (See Year Book, 1912, 207), as to the assay of black mustard.—J. pharm. chim., 22 (1920), 92.

Oil of Pennyroyal.—*Examination of a Commercial Sample of.*—G. M. Beringer examined a sample that was found to contain 50 per cent. of alcohol. Author describes the various tests applied, which include color, odor, specific gravity, boiling point, iodoform test for pulegone and the reduction with nascent hydrogen to form menthol.—Am. J. Pharm., 92 (1920), 460. (Bot. Abs.)

Oil of Peppermint.—*Piedmontese.*—Micheletti describes the cultivation of peppermint and the production of its oil in Italy. While the peppermint of the Piedmont district was formerly of poor quality, the planting in 1900 of specimens from Mitcham, England, has resulted in a type of peppermint yielding an oil of delightful aroma. The yield is 1 kilo of oil from 400 kilos of the fresh plants.—Chem. and Drug., 93 (1920), 1507.

Oil of Pimento Leaves.—Leaves of *Pimento Acris* yield by steam distillation 2.9 per cent. of a pale yellowish-brown volatile oil of pleasant, aromatic odor with a high percentage of phenols, almost entirely eugenol. Manufacturers to whom samples of the

oil were submitted consider it equivalent to the oil from pimento fruit.—Chem. and Drug., 92 (1920), 390, through Bot. Abs. (E. N. G.)

Oil of Pimento Leaf.—*Vanillin from.*—Campbell found that by the fermentation of pimento leaves the eugenol of its oil (see above) is spontaneously changed into iso-eugenol. From this, vanillin may be prepared and such a production of vanillin is about to be carried out on a commercial scale in Jamaica.—Chem. and Drug., 92 (1920), 1253.

Oil of Rose.—*Bulgarian Production.*—G. H. Kemper states that during the 12 years prior to the first Balkan War, 1900 to 1912, the manufacture of attar of roses in Bulgaria reached its highest development. In this period a large number of up-to-date factories equipped with modern steam stills were erected. The area planted with roses was increased to 20,000 acres. Owing to the wars that Bulgaria has since taken part in, the industry of rose culture has experienced a marked setback. From 1900 to 1912 the average annual production was 126,800 ounces of attar of roses. The production has since fallen to 52,000 ounces in 1919 and the yield for 1920 is expected to be even less. Under existing conditions it is stated that the production of attar of roses is not a paying industry. The high prices that farm products bring has resulted in the abandonment of 5,000 acres of rose gardens and the land planted with more renumerative crops.—Comm. Repts. through Am. J. Pharm., 92 (1920), 428. (J. K. T.)

Oil of Rose.—*Domestic.*—From a commercial point of view, the production of oil of rose in the United States would not be a profitable industry. The Bureau of Plant Industry of U. S. Department of Agriculture after extensive experiments in the cultivation of roses and the distillation of the oil from roses, finds that an excellent grade of oil of rose can be produced in the United States, but the cost of labor eliminates any profit from such an industry. A great deal of hard labor is needed to harvest the roses, which must be done quickly and at exactly the right time in order to get the best results. The world's supply of oil of rose comes from Bulgaria—here peasant proprietors on small farms of about eighteen acres cultivate the roses and distil the oil in the most primitive

fashion. The yearly output of oil is from three to four kilogrammes; small wonder that the wholesale price of a small quantity of oil of rose is so high.—Pacif. Drug. Rev., through Pharm. Era, 53 (1920), 324. (M. O'C. D.)

Oil of Rose.—*French.*—Jean de Lorgues describes the present state of rose cultivation in France. Up to 1911, "Rose de Mai" was the sole species cultivated for its oil, but now "Rose Brunner," "Rose Vanhoutte" and "Rose Nabonaud" are successfully used as sources of oil. Gattefosse has recently reported that an oil representing a mixture of these three varieties of roses has the specific gravity, 0.862 to 0.867; refractive index, 1.4600 to 1.4638; melting point, 23° to 28°; geraniol content, 35 to 37 per cent.; and citronellol content, 36 to 48 per cent. These oils are being successfully produced both by extraction with volatile solvents and by distillation.—Chem. and Drug., 93 (1920), 1629.

Oil of Rose.—*German.*—F. Elze found that oil of rose obtained in 0.015 per cent. yield by extraction with volatile solvents had the following constants: Sp. gr. = 0.9894 at 20°, $a_{100} = +0.6°$, acid value 3.15, ester value 2.9, acetylation value 317.5. Phenylethyl alcohol was the chief constituent, and in addition geraniol, citronellol, nerol, and the aliphatic sesquiterpene alcohol, farnesol, were identified. The stearopten contained several olefinic hydrocarbons with melting points ranging from 20° to 46°.—Chem. Ztg., through J. Soc. Chem. Ind., 39 (1919), 43A.

Oil of Rubieva Multifida.—*Properties of.*—E. K. Nelson examined a sample of this oil distilled experimentally from wild plants growing in California.

The oil is light yellow in color and has an odor suggesting anise and terpenes d 25° = 0.8542; $a_D = +35.75°$ (100 mm. tube).

On the first distillation about 60 per cent. comes over at 37-40° (under 3 mm. pressure). On repeated refractionation, about 85 per cent. of the oil was found to consist of a terpene fraction which, after rectifying over sodium, boils at 169-171° (under atmospheric pressure) D20° = 0.8507, $a_D = 46.4°$ (100 mm. tube).

The terpene fraction polymerizes rapidly on boiling at atmospheric pressure, has an odor resembling that of phellandrene, and

yields a nitrosite melting at 103-104°. Hence it consists largely of β-phellandrene. From the higher boiling portion of the oil anethol was separated. A resinous residue, probably polymerized phellandrene, was left on distillation.—J. Am. Chem. Soc., 42 (1920), 1286. (J. L. M.)

Oil of Sandalwood.—*Adulterated.*—Azor Thurston reports his findings in the examination of twenty samples of commercial sandalwood oil. He calls attention to the variation from standard due to castor or cotton seed oil and to cedarwood oil. The absence of fixed oils must be determined before applying the U. S. P. assay method for they increase the apparent percentage of santalol. Pure cottonseed oil gave 96.93 per cent. when acetylized and saponified by U. S. P. method.—J. Am. Pharm. Assoc., 9 (1920), 36. (Z. M. C.)

Oil of Sandalwood.—*Australian.*—It has been found that a marked chemical difference exists between the oil derived from Western Australian sandalwood and that obtained from Indian sandalwood. Recent research shows that the oil from the West Australian tree does not contain santalol, but a nearly related chemical compound. Medical practitioners who have used the Australian oil consider that it is quite equal to the true sandalwood oil without possessing the deleterious effects of the latter. The Western Australian Committee of the Institute of Science and Industry has referred the matter to the Institute with a view to having complete tests made as to the chemical and therapeutic properties of the oil, in order that action might be taken to have the Australian product inserted in the British Pharmacopœia.—Sci. and Ind., through J. Soc. Chem. Ind., 39 (1920), 111R.

Oil of Sassafras.—*Detection of Camphor Oil in.*—Inasmuch as the principal constituent of oil of sassafras is safrol which can be obtained from camphor oil in a fairly pure state, imitation oil of sassafras is produced in larger quantities than the natural oil. E. H. Grant has devised a method which gives relative proportions of the two oils but is unsuited for quantitative determinations. Oil of sassafras contains safrol, eugenol, pinene, phellandrene, d-camphor, sesquiterpenes; camphor oil is complex, containing all of the constituents of sassafras oil and also carvacrol. The five samples of

waste camphor oils, of the type known as "sassafrassy oils," that Mr. Grant examined showed carvacrol to be the predominating phenol. His method of distinguishing the oils depends on the formation of various colored diazo dyes. The phenols from the natural oils of sassafras give purplish-red dyes, identical with that made from eugenol while the dyes from waste camphor oils are orange-red and identical with that made from carvacrol. Mixtures give intermediate shades.—J. Am. Pharm. Assoc., 9 (1920), 1065. (Z. M. C.)

Oil of Spike Lavender.—*Properties of.*—The high prices which are being paid for the flowers of the spike confirm the belief that higher quotations will rule for the oil. Where in previous years large quantities of oil were obtained, this year some growers do not even take the trouble to install their distilling apparatus, as the sale of the flowers gave them a handsome profit. So much of the flower has been sold, that many distillations have been obtained from the stems alone. An analysis of the oil obtained from this source shows the following characteristics: Specific gravity at 15° C., 0.915 to 0.918; rotation, —3° to —5°; esters (linalyl acetate), 3 to 6%; solubility in alcohol (70%), 1.8 to 2 volumes; solubility in alcohol (65%), practicably imperceptible or in 10 to 12 volumes; odor, strong. In short, the characteristics differ very little from those of the essence obtained from the whole plant, only the latter is more soluble in alcohol 65 per cent. and the odor is somewhat finer.—Perf. Ess. Oil Rec., through Pharm. Era, 53 (1920), 79.

Terpin.—*Assay of.*—Fernandez and Luengo report that on treatment with acetic anhydride and anhydrous sodium acetate, only one of the two hydroxyl groups of terpin is acetylated; but when a solution of terpin in oil of turpentine is treated in like manner, complete acetylation is achieved.—Anal. Fis. Quim., through J. Soc. Chem. Ind., 39 (1920), 704A.

Thymol.—*Production from Cymene.*—Philips and Gibbs isolated para-cymene from a crude oil obtained from a sulphite spruce pulp mill. The product thus derived was purified by treatment with sulphuric acid, repeatedly washing, drying and final redistillation. The product upon nitration yields nitrocymene, which was then reduced to cymidine by means of iron powder and hydrochloric acid.

The cymidine was then sulphonated, yielding a mixture of *o*—and *p*—cymidine sulphonic acids. These in turn were converted into the corresponding diazo-cymenesulphonic acids. Both of the latter when treated with copper powder and ethyl alcohol yielded cymene-3-sulphonic acid. Fusing the sodium salt of this acid with sodium hydroxide yielded thymol.—J. Ind. Eng. Chem., 12 (1920), 145. (G. C. D.)

Thymol.—*Use in Herpes and Typhoid.*—Althoff considers herpes zoster an acute infection requiring a corresponding treatment, and he recommends the following ointment:

Thymol	1 Gm.
Liquefied phenol	1 Gm.
White petrolatum	to make 100 Gm.

This ointment is placed twice a day on the affected part. Moreover, three times a day a powder is given consisting of 0.5 gramme urotropin and 0.5 gramme aspirin in half a glass of water, followed by a cup of hot tea. Treatment should be started as early as possible, it relieves pain and the itching and shortens the duration of the complaint.

According to A. Géronne and W. Lenz another practical use for thymol consists of treating typhoid bacilli carriers with thymolized charcoal. Their experiments were dictated by the intention to use the coal as carrying medium for the disinfectant, and in this way to avoid too quick an absorption of the remedy. In three obstinate cases, where the patients kept throwing off bacilli, 3 grammes of charcoal and 3 grammes of thymol were given daily in single doses of 1 gramme each, the charcoal half an hour before, the thymol half an hour after meals. Treatment lasted from eight to fourteen days, during which time no appreciable incommodation of the stomach could be observed. In all three cases the secretions became free from typhoid bacilli after the time mentioned. The charcoal used was dry finely powdered animal charcoal. In every instance bacteriological examination of the feces showed an appreciable alteration of the picture on the Endo plate. It is evident that in this respect thymol as well as charcoal are useful, but more especially so in combination.—Schimmel's Rept., through Am. Drug., 68 (1920), 60.

Oil of Turpentine.—*New Method of Assay.*—Tauss and Schnabel have devised an assay method based upon the treatment of oil of turpentine with mercuric acetate, when a mercuro-acetate compound of the turpentine hydrocarbons is obtained. This body is separated from the reacting fluid and the mercury therein is assayed either volumetrically or gravimetrically.—Chem. Ztg., through Pharm., Zent., 61 (1920), 83.

ALCOHOLS AND DERIVATIVES.

Acetaldehyde and Acetone.—*Quantitative Separation of.*—E. Hägglund introduces into a pressure flask of about 120 mil content, 15 mils of water, 50 mils of half-normal silver nitrate, 9 mils of normal sodium hydroxide, 25 mils of ammonia water (sp. gr., 0.920) and 10 mils of the liquid to be assayed, which should contain not more than 2 per cent. of acetaldehyde. After closing the bottle it is heated in a boiling water-bath for 10 hours and then after cooling an aliquot portion of the filtrate is titrated for residual silver with tenth-normal thiocyanate; ferric alum being used as indicator.

The acetone in the mixture is assayed by the bisulphite method.—Z. anal. Chem., through Pharm. Zent., 61 (1920), 300.

Acetone.—*Purification of.*—Duclaux and Lanzenberg find that acetone forms with carbon disulphide a minimum boiling-point mixture. The acetone is mixed with 1.7 times its volume of carbon disulphide and the mixture distilled, the product passing over between 38° and 40° being collected in three fractions. The acetone is extracted from these fractions by water and the aqueous extracts are distilled, the fraction boiling at 56.1° to 56.3° being collected. If methyl alcohol is present in the acetone the minimum boiling point distillate of carbon disulphide and acetone is left to stand over potassium carbonate before extraction with water, and copper sulphate is added to the subsequent aqueous extract before distillation. In this way most of the methyl alcohol is removed.—Bull. Soc. Chem., through J. Soc. Chem. Ind., 39 (1920), 764A.

Acetone.—*Titration Assay of.*—R. S. Hubbard has modified Messinger's process so as to make it applicable to the analysis of very dilute acetone solutions. A process of repeated distillation is

described whereby acetone may be separated from comparatively large amounts of alcohol and other substances which interfere with the accuracy of the method.—J. Biol. Chem., through J. Soc. Chem. Ind., 39 (1920), 674A.

Acrolein.—*New Reaction for.*—L. Tsalapatanis heats the sample with 1 to 2 mils of an aqueous solution of resorcinol and a few drops of 10 per cent. caustic soda solution. After 2 minutes a bluish-green coloration appears in dilute, and a red one in concentrated, solutions. The reaction is extremely sensitive. The color, which is very stable, is destroyed by acids, but restored by caustic soda.—Ann. Soc. Quim. Argentina, through J. Soc. Chem. Ind., 39 (1920), 425A.

Alcohols.—*Catalytic Oxidation of.*—Moureu and Mignonac employ as catalyzer metallic silver produced by reduction of silver nitrate with formaldehyde. This they heat to 300° or 400° and then pass over the heated mass the vapors of the alcohol, accompanied by a little less than the theoretical quantity of air. In some cases the alcohol vapor and half of the theoretical quantity of air are passed over one batch of the catalyst and the resultant vapor is then mixed with a second quantity of air and passed over a second batch of the heated catalyzer. This process oxidizes primary alcohols to aldehydes and secondary alcohols to ketones.—Compt. rend., through J. pharm. chim., 22 (1920), 34.

Amylene Hydrate.—*Toxicity of.*—Jacobi and Speer report a fatal case of amylene hydrate poisoning in which a hospital nurse gave a patient an enema containing 35 grammes of amylene hydrate, instead of the 6 grammes that had been prescribed. Despite antidotal treatment the patient died after 53 hours.—Pharm. Ztg., 65 (1920), 710.

Amyl Nitrite.—*Decomposition Products of.*—Along the walls and bottom of a container in which was stored a considerable quantity of amyl nitrite, which had partially undergone decomposition, the deposition of a number of small crystals was noted by Sandquist and Mohlin. A similar observation was made by Boettger about 5 years ago, and he erroneously claimed that the crystals consisted of methane-tetra-carbonic acid. Closer study at this time,

however, has established their undoubted identity. The crystals are small and melt at 127°. They consist of ammoniumu tetraoxalate. $C_2O_4H(NH_4)C_2O_4H_2+2H_2O$.—Pharm. Zent., 61 (1920), 371-0455. (G. C. D.)

Amyl Nitrite.—*Dangerous Impurity in.*—Heiduschka reports a case of apparent amyl nitrite poisoning probably due to impurities in the product, which occurred at a hospital in Wurzburg, Germany. Only a small sample of the amyl nitrite, which produced the symtoms of poisoning in a child, was available for examination. It did not have the odor of pure amyl nitrite. An odor of butyric acid and butyric acid ester was discernible. The specific gravity at 15° was 0.9022, the standard being 0.875 to 0.885. The boiling point was 87.5°, the standard being 95° to 97°. The reaction was acid.—Pharm. Zent., 61 (1920), 205. (R. P. F.)

Butyl Alcohol.—*Use in Determining Saponification Numbers.*—Pardee, Hasche and Reid report the result of a series of experiments to determine the relative value of ethyl alcohol and normal butyl alcohol as a solvent or medium in the saponification of fats, waxes, etc., in which it is shown that apparently owing to the higher boiling point of the butyl alcohol, the time of heating is much shortened, and higher and more consistent results are obtained. This is more noticeable in the case of fats and waxes as in the case of beeswax, wool fat, etc.—J. Ind. Eng. Chem., 12 (1920), 481. (L. A. B.)

Carbon Tetrachloride.—*Poison Gases from.*—Fieldner, Katz and others, as a result of a fatal accident from the use of a carbon tetrachloride fire extinguisher, conducted a series of experiments with pure carbon tetrachloride and with liquids contained in fire extinguishers. They found that when the liquid was poured on a fire, or on a hot iron in a closed chamber, or if the vapor, mixed with air, was passed through an iron or quartz tube, heated to 600° to 800° phosgene in toxic quantity (12.30 per cent. to 13.80 per cent.) was formed. At the same time quantities of chlorine, ranging from 12 per cent to 20 per cent resulted, together with smaller quantities of hydrogen chloride, 5.60 per cent to 11.90 per cent.

In some of the experiments conducted in tubes, as much as one-half of the carbon tetrachloride was decomposed. The presence of turpentine resulted in a considerable reduction of the amount

of chlorine formed, but had no effect in limiting or lessening the quantity of phosgene. As a result of the experiments it is recommended that such extinguishers should not be employed under conditions which necessitate the breathing of the fumes. Or if this is unavoidable, it is recommended that the standard type of army gas mask be employed as a protection.—J. Frank. Inst., 190 (1920), 543. (G. C. D.)

Carbon Tetrachloride.—*Therapeutic Value of.*—Jacquemet and Goubeau find that carbon tetrachloride is a valuable surgical antiseptic, being useful to disinfect the skin or surgical instruments, as a parasiticide or as a remedy for fetid wounds.—J. pharm. chim., 21 (1921), 455.

Ceryl Alcohol and Cerotic Acid.—*Formulæ of.*—A. Gascard finds that Chinese wax consists for the most part of ceryl cerotate. Brodie's formulæ for ceryl alcohol ($C_{27}H_{55}OH$) and for cerotic acid ($C_{26}H_{53}CO_2H$) are confirmed.—Compt. rend., through J. Soc. Chem. Ind., 39 (1920), 495A.

Chloretone.—*Benzoyl Ester of.*—T. B. Aldrich prepared the benzoyl ester of chloretone, $C_6H_5CO.OC\text{-}C_3H_6Cl_3$ by heating molecular quantities of benzoyl chloride and anhydrous chloretone on the steam bath until hydrogen chloride ceases to be given off. The ester is a solid which melted between 35-35° and is not an oil as claimed by Willgerodt and Dürr, and may be distilled under reduced pressure without decomposition. It is not readily saponified, and in this respect is much more stable than the other esters previously studied. Boiling with concentrated nitric acid does not decompose it as is the case with the aliphatic esters of both chloretone and brometone. Pharmacological tests would indicate that it possesses less hypnotic or anesthetic properties and is less toxic than the esters studied thus far.—J. Am. Chem. Soc., 42 (1920), 1502. (J. L. M.)

Chloroform.—*Assay of.*—Schlicht and Austen assays chloroform in a mixture of the same with alcohol, by diluting 5 mils of the sample with water to 200 mils shaking with 60 mils of ether, and, after separation, the sp. gr. of the ether is determined. Each increase of 0.0001 in the sp. gr. corresponds with 0.1786 gramme of chloroform in the alcohol-chloroform mixture. The sp. gr. of the

latter gives an approximate measure of the alcoholic strength, after the chloroform has been determined and an allowance made for its sp. gr.—Z. oeffent. Chem., through J. Soc. Chem. Ind., 39 (1920), 526A.

Chloroform.—*Manufacture from Coke Oven Gas.*—A. J. Dey exhibited a specimen of chloroform from coal-gas, or perhaps more correctly from coke-oven gas, produced as a by-product in connection with the works of the Skinning Grove Iron Co. Of course there is nothing new in making chloroform from ethyl alcohol, but this specimen is interesting as being the first that has been seen made from ethyl alcohol obtained as a waste product from coke-oven gas. On examination the sample responds to all the recognized tests for pure chloroform of the British Pharmacopœia, with the exception that when evaporated there remains a characteristic odor which is reminiscent of a smell not infrequently observed in dissolving metallic iron in a dilute mineral acid. It was found that the sample could be freed from this impurity by treatment with sulphuric acid, and it seems highly probable that it is a hydrocarbon or a mercaptan. It is hardly likely that coke oven gas will become a source from which to manufacture chloroform, though it may probably be a commercial source for the production of ethyl alcohol for industrial purposes.—Chem. & Drug., 92 (1920), 421.

Chloroform.—*Preservation of.*—Utz reviews the claims which have been made in the employment of terpineol as a preservative for chloroform, and arrives at the conclusion, that not only is the preservative useless, but that samples treated with it, are more prone to decomposition.—Süddtsch Apoth. Ztg., through Pharm. Ztg., 65 (1920), 264. (G. C. D.)

Chloroform.—*Sodium Carbonate as Antidote for.*—Graham has carried out some further experiments on chloroform and reports that the criticisms made of his earlier experiments were not justified. In a trial on dogs, one dog which had been poisoned with chloroform was given 239 mils of a solution containing 1 per cent. soda and 1½ per cent. sodium chloride. Another dog which had been poisoned in the same way was treated with sodium chloride solution alone. This dog died in less than 24 hours, while the first one recovered completely. The liver and kidneys of the second

dog showed marked effects from the chloroform. Graham thinks that these experiments corroborate the earlier statements that the administration of alkali will counteract chloroform poisoning.—Arch. Int. Med., through Pharm. Era, 53 (1920), 305.

Chloroform Anesthesia.—*Eau de Cologne in.*—The use of eau de Cologne as an adjunct to prevent vomiting in chloroform anesthesia was advocated in this country by Barker in 1914. Jeanneuey finds that when the patient inhales the perfume throughout the period of anesthesia it will prevent the vomiting due to the odor of the anesthetic, but it has no effect on psychical vomiting or on the sickness symptomatic of chloroform poisoning.—J. Med. Bordeaux, through Pharm. J., 104 (1920), 6.

Dichlorethyl Sulphide.—*Detection of.*—F. Martin describes his work during the war in detecting the presence of this "mustard gas" or *"yperite."* Among a number of tests he describes, he considers as extremely sensitive the cloudiness produced with Denigès reagent (acid mercuric sulphate solution).—J. pharm. chim., 22 (1920), 161.

Dichlorethylene.—*Use as a Solvent.*—A. Langer recommends dichlorethylene as a solvent, especially in shaking out alkaloids. Its chief drawback is its instability, but it keeps fairly well if stored in brown bottles containing some pieces of slightly moist potassium hydroxide. Langer points out that commercial dichlorethylene (sp. gr. 1.300; boiling point, 52° to 60°) is a mixture of true dichlorethylene (boiling point 55°) and trichlorethylene (sp. gr. 1.465; boiling point 88°).—Apoth. Ztg., through Pharm. Ztg., 65 (1920), 444.

Ether.—*Action on Microbes.*—Rouquier and Tricoire find that the action of ether on bacteria is very variable. Some microbes are very sensitive to it, and are killed by contact for an hour, or less, in duration. Among these are *B. pyocyaneus; Proteus* x 19; *M. prodigiosus;* Shiga's, Flexner's bacilli; and the meningococcus. Some are killed in more than an hour, but in less than twenty-four hours. These are the diphtheria and pneumonia bacilli. *B. coli,* the enterococcus, streptococcus, *Staphylococcus aureus,* are only killed after several days' contact. The pneumococcus, and some spore-

bearing anærobic bacilli, will remain alive after eight to ten days' contact with ether.—Compt. rend., Sci. biol., through Pharm. J., 105 (1920), 188.

Ether.—*Cotton Process.*—This product has been submitted to the Council on Pharmacy and Chemistry and will be thus defined: An improved anesthesia ether consisting of highly refined diethyl oxide with approximately two volumes of ethylene, one-half volume carbon dioxide and one per cent. by weight of ethyl alcohol.—J. Am. Med. Assoc., 74 (1920), 1474. (W. A. P.)

Ether.—*Injections in Whooping Cough.*—French journals are giving considerable attention to this method of administration of ether. Remarkable results are claimed for it by Weil and Dupur (who introduced it in 1914), while Variot and Audrain have noticed remarkable cures and complete failures. Audrain thinks that these failures are explained by a faulty diagnosis. He believes that acute congestion affecting adenoid conditions of the nasopharynx may give rise to symptoms resembling those of whooping cough. He differentiates the two conditions as follows: In whooping-cough the fits of coughing are relatively infrequent; in adenoid congestion they are very frequent. The whooping accompanies each fit in the whooping-cough, and is prolonged and typical, while with adenoid congestion it only accompanies a few fits of coughing, is short and hoarse in character, and "leaves a doubt in the mind." Up to the age of eight months a dose of 1 mil is sufficient; in other children 2 mils are injected. The injections are made every second day. Broncho-pneumonic complications of whooping-cough do not constitute a contra-indication to injection, but appear to be benefited by it.—Med. Press, through Pharm. J., 105 (1920) 250.

Ether.—*Tests for.*—F. Dietze discusses the monograph for ether found in U. S. P. IX. Comparing it with the monograph of the German Pharmacopœia, he concludes that American ether does not need be as pure as the German product. Discussing the cadmium-potassium iodide test for peroxide, he states his preference for the simpler and more accurate procedure given below:

Prepare a solution of unoxidized ferrous ammonium sulphate (0.1 gramme) in 2 mils of freshly boiled and then cooled water and then adding 1 drop of diluted sulphuric acid. Pour into a test

tube 1 mil of n/10 ammonium thiocyanate solution and layer thereon 5 mils of the ether under test. Then add 2 drops of the ferrous solution and note whether a red ring occurs at the point of contact of the two liquids, within 30 seconds. If the coloration appears, peroxides are indicated.—D.-A. Apoth. Ztg., 41 (1920), 100.

Ether.—*Using Unfit.*—In a damage suit involving alleged medical malpractice, the Supreme Court of Minnesota denied the surgeons who had administered the ether a new trial, after a verdict had been entered against both the manufacturer and the surgeons. The Supreme Courts holds that for the death which resulted from the use of the unfit ether both the manufacturer and the surgeons were responsible. The surgeons were held to be negligent in administering to a patient ether that was unfit for use and in their care after the ether was administered.—J. Am. Med. Assoc., 75 (1920), 763. (W. A. P.)

Ethyl Acetate.—*Use as Precipitant for Proteins.*—A. Marie finds that ethyl acetate gives a marked precipitate with even dilute solutions of proteins, and a turbidity with peptones, proteoses, or albumoses. On the other hand, solutions of amino-acids or of vegetable or animal alkaloids show no change on the addition of ethyl acetate.—Am. Inst. Pasteur, through J. Soc. Chem. Ind., 39 (1920), 431A.

Ethyl Alcohol.—*Assay in Mixtures Containing Sulphuric Acid and Water.*—Butler and Dunnicliff, in the course of an investigation on the possibility of recovering sulphuric acid from nitre cake by alcohol devised the following method for estimating the constituents:

The combined alcohol is estimated by determining the amount of acid which has undergone esterification. A weighed quantity of alcoholic sulphuric acid is titrated against standard alkali. This titration (b) gives the percentage of acid present and the ethyl hydrogen sulphate in terms of H_2SO_4.

The total acidity is found by evaporating a weighed quantity of the liquid with an excess of standard alkali, heated to 120° extracting with water, titrating the excess alkali with standard acid. From this is calculated the percentage acidity of the alcoholic sulphuric

acid before any esterification took place expressed as percentage of H_2SO_4 (a). Thus the percentage of acid esterfied is:

$$\frac{2\ (a—b)}{a \times 100}$$

The weight of esterified alcohol in 100 grammes is:

$$\frac{2\ (a—b)}{a \times 100} \times \frac{46}{98}$$

Free alcohol is determined by weighing out 25 grammes making faintly alkaline with sodium carbonate distilling until 95 mils have been collected, taking the specific gravity of it and calculating as usual.—J. Soc. Chem. Ind., 39 (1920), 146T.

Ethyl Alcohol.—*Detection of Water in.*—F. Henle prepares a xylene solution of partially decomposed aluminum ethoxide by allowing aluminum turnings (27 grammes) absolute alcohol (276 grammes) and mercuric chloride (0.2 gramme) to react until the evolution of hydrogen subsides and then heating the product on the water bath until it appears dry. The alcohol of crystallization is then distilled from an oil bath at 210° to 220°, and the crude aluminum ethoxide is subsequently cautiously heated to about 340° (thermometer immersed in the molten mass); after about 1 hour the temperature falls to about 330° and heating is then discontinued. The product while still hot, is dissolved in 500 mils of boiling xylene and the solution is filtered through a dry paper; the clear, pale yellowish-brown filtrate can be preserved indefinitely if air and moisture are excluded. If a few drops of the reagent be added to a few mils of the liquid under examination, then, according to the quantity of water present, a voluminous, gelatinous precipitate of aluminum hydroxide is formed immediately or in the course of a few seconds. The percentage of water which can thus be detected in various solvents is as follows: ethyl alcohol, 0.05; methyl alcohol, 0.1; ether 0.005; ethyl acetate, 0.1; acetaldehyde, 0.1; acetone, 1. The two substances last named also yield white turbidities due to the precipitation of aluminum ethoxide from the reagent, but these can be readily distinguished from aluminum hydroxide, since they immediately disappear on addition of a larger excess of reagent or of xylene.—Ber., through J. Soc. Chem. Ind., 39 (1920), 501A.

Ethyl Alcohol.—*Detection of Methyl Alcohol in.*—These tests will be found under methyl alcohol (page 506).—EDITOR.

Ethyl Alcohol.—*Improved Lieben's Reaction for.*—R. Kunz treats 10 mils of the dilute alcohol solution (*c. g.*, 1 drop of alcohol in 100 mils of water) with 2 mils of 10 per cent sodium hydroxide solution, 0.15 grammes of potassium iodide, and 0.2 grammes potassium persulphate, and heat the mixture at 50° to 60°. A turbidity due to the formation of iodoform, develops in about 10 minutes.—Z. anal. Chem., through J. Soc. Chem. Ind., 39 (1920), 764A.

Ethyl Alcohol.—*Manufacture from Coal Gas.*—Lebeau and Damiens have shown, that in the presence of catalysts such as vanadic, uranic, tungstic, or molybdic acids, sulphuric acid rapidly and completely absorbs ethylene, and it has since been shown by Damiens that the ethylene is absorbed as ethyl hydrogen sulphate. E. De Loisy makes use of these two important facts in his process. The coal gas is bubbled through the acid at a concentration of 66° B., and by suitable subsequent dilution and distillation alcohol or ether may be obtained as required. The diluted acid serves for the preparation of ammonium sulphate. Since, however, twice as much acid is required for the absorption of ethylene as for the production of ammonium sulphate, a portion of the acid is concentrated by means of the waste heat from the gas coming from the coke ovens, and can thus be used either for the absorption of the ethylene or for the preliminary drying of the gases and the absorption of the traces of propylene, butylene, and acetylenic hydrocarbons present. By this method it is only necessary to replace the acid removed in the form of ammonium sulphate.—Compt. rend., through J. Soc. Chem. Ind., 39 (1920), 147A.

Ethyl Alcohol.—*Substitutes for.*—H. C. Fuller reports that researches covering a very large number of products have been carried on in order to find a substitute for alcohol as a solvent and preservative in medicinal preparations.

Glycerin is entirely satisfactory in some cases and several derivatives of glycerin appear to meet necessary conditions. Acetone may prove less toxic than it has been believed to be, which would make its use, in external remedies permissible. The work is an

important one and much has already been accomplished.—J. Am. Pharm. Assoc., 9 (1920), 246. Z. M. C.)

Ethyl Alcohol.—*Thoretical Yield on Fermentation.*—Magne states that the products of the fermentation of pure sugars are not only alcohol and carbon dioxide, but glycerin, succinic acid, etc., and for this reason the "theoretical" yield is less (7.31 gallons absolute alcohol per 100 pounds of sugar) than the "ideal" yield (7.72 gallons). From cane molasses no more than 95 per cent of the theoretical yield can be obtained even under the most favorable conditions, on account of salts and organic non-sugars present. Molasses fermentation with the yeast naturally present gives 40 to 60 per cent. of the theoretical yield; with compressed yeast 50 to 75 per cent.; with the aid of antiseptics 70 to 85 per cent; and with pure culture yeast 85 to 95 per cent.—La Planter, through Pharm. Era, 53 (1920), 140.

"Proof Spirit."—*What is it?*—R. R. Foran says that this term is of British origin, American adoption, and universal confusion. The term "proof spirit" came about in a rather peculiar way. The British Excise determined the strength of spirits by pouring a certain amount on gunpowder. A light was then applied. If the spirit was above a certain strength ("proof") the gunpowder ultimately inflamed, but if weaker the powder was too much moistened by the water to be capable of explosion, and the result was said to be "under proof." Later this method was discarded and an Act of Parliament defined "proof spirit" as a liquid of such density that, at 51° Fahrenheit thirteen volumes shall weigh the same as twelve volumes of water at the same temperature. It should have a specific gravity of 0.91984 and 49.24 per cent. by weight or 57.06 per cent. by volume of alcohol.

The Internal Revenue Department of the United States defines "proof spirit" as containing one-half of its volume of alcohol of a sp. gr. of 0.7939 at 60° Fahrenheit. This, it goes on to say, "will correspond to a specific gravity of about 0.9341 if water at 60° Fahrenheit be taken as unity and to a content of 42.7 per cent. by weight of absolute alcohol. Absolute alcohol would contain 200 per cent of 'proof spirit' according to the United States system, instead of 175.25 per cent in the English system." This difference between the two governments has resulted in much confusion in the definition

of the term "proof spirit" and a perusal of a number of scientific works discloses much misinformation on the subject. The conclusion arrived at is that "proof spirit" is correctly defined as containing 50 per cent. by volume of absolute alcohol. This corresponds to 42.7 per cent. by weight, and the sp. gr. should be 0.9341 at 60° Fahrenheit.—Am. J. Pharm., 92 (1920), 11. (J. K. T.)

Ethyl Bromide.—*Toxicity of.*—O. Steiger describes at length the toxic symptoms produced by ethyl bromide, the action of which resembles that of bromoform and methyl iodide.—Münch Med. Wschs., through Pharm. Zent., 61 (1920), 72.

Ethyl Chloride.—*Technical Application of.*—Albert Henning outlines briefly the history of ethyl chloride. When first manufactured, ethyl chloride was used only for medical purposes. Previous to the war, large quantities were being manufactured in Europe and America and used for technical purposes.

There are many misconceptions regarding the properties of ethyl chloride. According to observations made by Mr. Henning, it is absolutely unnecessary to store ethyl chloride in high pressure cylinders. It should be regarded as a volatile liquid rather than a liquefied gas. In fact, English railroad regulations regarding ethyl chloride are very elastic. Ethyl chloride evaporates very slowly when exposed. It may be considered as an inflammable, non-explosive, non-poisonous liquid. Ethyl chloride holds only the slightest trace of water (1-3000), and its boiling point is 9° to 12°.

The principal technical applications of ethyl chloride are: (1) In the synthesis of dyestuffs and drugs as an ethylating agent; (2) As a working substance in refrigating machinery; (3) As a solvent for extraction purposes; (4) In research work and in laboratory practice.

Also, ethyl chloride is used for medical purposes, mostly as a local anesthetic.

Mr. Henning also presents several cuts and tables, principally showing comparative costs of ethylating agents and the thermal properties of ethyl chloride.—J. Soc. Chem. Ind., 39 (1920), 1T. (H. M.)

Ethyl Nitrite.—*Modification in Process of Manufacture.*—In the manufacture of ethyl nitrite as given under spirit of nitrous ether in

U. S. P. IX, the ethyl nitrite is washed in a separate funnel. C. H. Pitt points out that such washing results in great losses by volatilization. He reduces these losses to the minimum, by carrying out the ethyl nitrite reaction in a corked flask provided with a thistle funnel and a tube bent with two right angles, communicating directly with the interior of a second flask, both flasks in an ice bath and when the ethyl nitrate separates to the top of the fluid in the reaction flask, ice water is poured through the thistle funnel into the flask, thus forcing the ethyl nitrite into the second flask in which it can be washed by reversing the corks fitting into the two flasks.—Am. J. Pharm., 92 (1920), 801.

Formaldehyde.—*Color Reactions for.*—A. Rossi finds that solutions of a few centigrammes of the following ten aromatic compounds in sulphuric acid give color reaction with 0.1 per cent. and 0.001 per cent solutions of formaldehyde. Gallic acid gives a red-brown ring at the zone of contact of the liquids, and on shaking the tube a green liquid changing to grey-green is obtained. Tannic acid gives a red-brown ring, whilst on mixing the color is greenish-blue at the bottom, and subsequently brownish-red throughout. Pyrogallol gives a wine-red ring and red-brown liquid. The test is capable of detecting 0.00001 per cent of formaldehyde. Salicylic acid gives a light-rose color red ring and solution. Catechol gives a violet-red ring and wine-red liquid, and resorcinol a wine-red ring and liquid. Beta-naphthol gives a violet-red ring, whilst the liquid becomes brownish-black with green fluorescence, and similar colorations are obtained with benzonaphthol. Phenyl salicylate gives a carmine-red ring and a reddish-yellow liquid, becoming pink on dilution. Phenolphthalein does not form a ring, but gives an orange liquid changing to carmine-red when shaken. On dilution with water a carmine precipitate separates whilst the solution remains colorless. —Boll. Chim. Farm., through J. Soc. Chem. Ind., 39 (1920), 42A.

Formaldehyde.—*Diastasic Properties of.*—Woker and Maggi give a recapitulation of the evidence on which they base their view that formaldehyde resembles diastase in its action on starch. Recent criticisms are met by the assumption that the opponents of the theory kept their mixtures too long, for the authors believe that the hydrolytic products are in time rebuilt into non-hydrolysable and non-reducing substances, such as the so-called "reversion dextrin,"

just as when egg-albumen is digested with papain there is a reversion of the process after a time.—Ber., through J. Soc. Chem. Ind., 39 (1920), 77A.

Formaldehyde.—*Phloroglucinol Test for.*—P. J. Hanzlik reports that the minimum alkalinity necessary for a positive reaction in the phloroglucinol test for formaldehyde is equivalent to P_H=12.13. The optimum alkalinity is P_H=13.0.—J. Biol. Chem., through J. Soc. Chem. Ind., 39 (1920), 610A.

Formaldehyde.—*Preparation of.*—M. D. Thomas summarizes the results of his investigations of the preparation of formaldehyde as follows:

Silver is more active as a catalyst that either gold or copper in inducing the dehydrogenation of methyl alcohol. At the same time is causes less decomposition of formaldehyde so that the yield of this product is greater with silver than with copper or gold.

Evidence is given to indicate that the essential reactions are dehydrogenations followed by the oxidation of hydrogen and carbon monoxide.—J. Am. Soc. 42 (1920), 867. (J. L. M.)

Formaldehyde.—*Preparation of Gas with Caustic Soda.*—G. E. E'we finds that this method is not economical since a large proportion of the formaldehyde is rendered non-volatile by the caustic soda. It is not efficient owing to the small amount of formaldehyde gas liberated.—Proc. Penna. Phar., Assoc., 45 (1920), 250. (L. S.)

Formaldehyde.—*Properties of the Commercial Solution.*—G. F. Merson states that in commercial formaldehyde there is normally present 10 to 20 per cent. of free methyl alcohol. Wood spirit or true methyl alcohol in its pure state is subject to excise duty, but it has been customary to pass as "duty free" methyl alcohol contained in commercial formaldehyde. During the war practically all supplies came from the United States of America. When the U. S. A. went "dry" and ethyl alcohol had become a drug on the market, a sample of formaldehyde was found to contain over 13 per cent. of proof spirit (ethyl alcohol), while the usual percentage of methyl alcohol was absent. A study of the economic conditions indicated that, while the cost of methyl alcohol had been steadily

rising, that of ethyl alcohol had fallen to such an extent that it paid handsomely to use the latter spirit as a "filler" to take the place of part of the free methyl alcohol normally present in commercial formaldehyle.—Chem. & Drug., 93 (1920), 177.

Fusel Oil.—*Unusual Acids in.*—E. Luce examining a sample of fusel oil of unknown origin, found therein 3 per cent. of pelargonic acid and 9.5 per cent. of capric acid. In the paper he discusses the possibility of the formation of such acids in alcohol fermentation.—J. pharm. chim., 22 (1920), 136.

Glycerin.—*American Exports of.*—The United States exported 3,963,392 pounds of glycerin, valued at $1,190,984.00 during 1919. Japan received 2,459,097 pounds; Norway, 262,880 pounds; Argentina, 239,226 pounds; China, 120,270 pounds; Canada, 119,965 pounds; Cuba, 109,124 pounds; Chili, 96,678 pounds; Mexico, 60,530 pounds; British India, 57,250 pounds; Hong Kong, 57,199 pounds; Brazil, 47,026 pounds; Sweden, 39,095 pounds; Peru, 37,718 pounds; and Great Britain, 22,682 pounds.—Chem. & Drug., 92 (1920), 820. (K. S. B.)

Glycerin.—*Production from Sugar.*—During the war 2,200,000 pounds of glycerin per month were manufactured from sugar by fermenting the latter with yeast. The ordinary yield, about 3 per cent., was increased to 12.7 per cent. by the addition of a weak alkali. The alkali wash presented a fine breeding place for polluting bacteria. This was overcome by the use of sodium sulphite which kills the lactic acid bacteria but does not effect the Saccharomyces. Alcohol, carbon dioxide and acetaldehyde are by-products. The use of sulphite increases the yield of glycerin to from 23 to 36.7 per cent. The amount of acetaldehyde was also increased and less carbon dioxide and alcohol were produced. Attempts to produce glycerin from sugar in Austria was said to have failed.—J. Soc. Arts., through Chem. News, 121 (1920), 261. (J. H.)

Glycerin.—*Substitutes for.*—The technical uses of glycerol, apart from the production of explosives, depend on its viscosity, hygroscopicity, and neutrality; these properties are also exhibited by aqueous solutions of sodium and potassium lactates (per- and

perka-glycerol respectively), which have been extensively used by the belligerent forces of the Central Powers and for medical and cosmetic purposes during the late war. Economically, their preparation permits a much better utilization of the initial material (sugar, etc.), since this can be fermented so as to yield 95 per cent. and more lactic acid, while on the technical scale, it only gives one-fifth to a quarter of its weight of glycerol; further, for many purposes, the glycerol substitutes can be used in considerably more dilute solution than glycerol itself. Neuberg and Reinfurth present a paper on the subject containing an extended series of tables and graphs showing the relationship between specific gravity and concentration of aqueous solutions of per- and perka-glycerol at 15°, the freezing point of solutions of per-glycerol at different concentrations, the comparative freezing point of equimolar solutions of per-glycerol and glycerol, the boiling points of solutions of per-glycerol, the comparative hygroscopicity of solutions of glycerol and per-glycerol at 25°, and the visocity of per-glycerol.—Ber., through J. Soc. Chem. Ind., 39 (1920), 801A.

Isoamyl Alcohol.—*Preparation of.*—F. Martin discusses in detail the production of isoamyl alcohol from fusel oil by the method suggested by Pasteur in 1855. This consisted of treating the fusel oil with sulphuric acid and then separating the amyl sulphates of the two bodies isoamyl alcohol and levogyrate amyl alcohol, by fractional crystallization of their respective barium salts.

Martin's conclusions are that the strength of the sulphuric acid should be 90 to 91 per cent.; that the amount of acid employed should be about 20 per cent. greater than the theoretical quantity; and that the alcohol is not more than 55 to 60 per cent.—J. pharm. chim., 22 (1920), 220.

Melissyl Alcohol and Melissic Acid.—*Properties of.*—Heiduschka and Gareis state that carnauba melissyl alcohol and beeswax melissyl alcohol have been characterized by a series of derivatives and shown to have the formulæ $C_{30}H_{61}OH$ and $C_{31}H_{63}OH$ respectively. Melissic acid from carnauba melissyl alcohol has melting point 90° (lead salt, melting point 118°), while that from beeswax had melting point 88.5° (lead salt, melting point 115°), and was identical with the product of hydrolysis of carnauba

melissyl cyanide.—J. prakt. Chem., through J. Soc. Chem. Ind., 39 (1920), 163A.

Methyl Chloride and Bromide.—Boulin and Simon find that methyl chloride may be readily prepared by allowing dimethyl sulphate to drop into hydrochloric acid (16° B., sp. gr. 1.125) at about 50°, or into a concentrated solution of sodium chloride at 60° to 65°. Similarly methyl bromide may be prepared by using hydrobromic acid at 45° to 50°, or, preferably, a concentrated solution of an alkali bromide, slightly acidified with sulphuric acid, at 30° to 35°. In all these cases the yield is about 90 per cent of theory.—Compt. rend., through J. Soc. Chem. Ind., 39 (1920), 312A.

Methyl Alcohol.—*Assay of.*—Schryver and Wood publish a new method for estimating methyl alcohol in water, ethyl alcohol and acetone. The method depends on the oxidation of methyl alcohol to formaldehyde by means of ammonium persulphate and identifying this by means of phenylhydrazine hydrochloride, potassium ferricyanide and hydrochloric acid. A red color is produced when as little as one part of formaldehyde is present in two million parts of liquid. Since, however, ammonium persulphate is a strong oxidizing agent, an excess should be avoided, as otherwise the formaldehyde is split up into carbonic acid and water. The authors proceed as follows: Five mil samples of the solution under test are placed into test tubes and mixed with 5 mils of ammonium persulphate solutions of different strengths. The tubes are then heated in a boiling water bath for ten minutes, then to one mil of each of the liquids, one mil of a one per cent. phenylhydrazine hydrochloride solution, one mil of a 2.5 per cent. potassium ferricyanide solution and 3 mils of strong hydrochloric acid are added. By this method the exact amount of persulphate necessary for the oxidation can be found. This amount can also be found by adding to a certain quantity of ammonium persulphate solution varying amounts of methyl alcohol. The percentage of methyl alcohol can be calculated according to the equation, $\% = Kc$ in which c is the concentration of the persulphate solution in per cent. and K is a constant, which was found to be 0.059. In ethyl alcohol methyl alcohol cannot be estimated by this method because the persulphate

oxidizes both alcohols. Ten mils of the mixed alcohols are mixed with 50 mils of water and 5 mils of this mixture are heated in a test tube provided with a condensing tube with 5 mils of a one per cent. persulphate solution for 10 minutes in a boiling water bath. One mil of the mixture is then heated with one mil of a one per cent. phenylhydrazine hydrochloride solution for 5 minutes in a boiling water bath, in order to split up any ethylal or methylal which might have been formed, and after allowing the mixture to cool one mil of a 2.5 per cent. potassium ferricyanide solution and 3 mils of strong hydrochloric acid are added. The red color obtained when methyl alcohol is present is then compared with those obtained by treating mixtures of ethyl alcohol and methyl alcohol of known strengths as just given. For estimating methyl alcohol in acetone the process applied to aqueous methyl alcohol solutions can be applied, because acetone is not readily oxidized by persulphate. At times and especially when the acetone contains less than 4 per cent of methyl alcohol, a condensation product of the two is formed, which is only difficultly oxidized. In such a case not a bright red color is obtained but a faint pink.—Analyst, through Pharm. Weekbl., 57 (1920), 1412. (H. E.)

Heiduschka and Wolf report the quantitative estimation of methyl alcohol by the weight of CO_2 obained by oxidation with chromic acid, and also by titration of the excess acid with sodium thiosulphate and calculating the results from the formula given below:

$$CO_2 \text{found} : X = 44 : 32.3$$
$$\text{Acid used} : X = 48 : 32.2$$

(X represents the amount of CH_3OH to be estimated.)

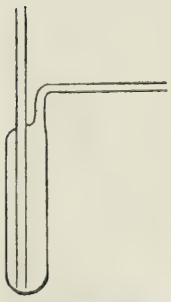


FIG. 22.

The process of oxidation to the end product, CO_2, is very slow if carried on in cold solution and if heated there is danger of loss of the intermediate product formaldehyde.

To overcome this difficulty and to reduce the time of the reaction to a minimum a simple apparatus (Fig. 22) was constructed, consisting of a strong closed flask of about 150 mils capacity, having two inlet tubes, one straight, reaching almost to the bottom, the other bent at right angles, both entering on top of flask.

The working formula is as follows: First remove all CO_2 from the flask by passing through it for ten minutes air free from carbon dioxide. Next by means of a funnel having a very fine stem pour into the straight tube: 10 mils of diluted methyl alcohol containing 0.05 gramme CH_3OH, 15 mils of N/1 potassium dichromate solution, and 20 mils of sulphuric acid, 30 per cent. 15 mils of N/1 potassium dichromate solution, and 20 mils of sulphuric acid, 30 per cent.

Now seal the flask by heating the ends of the inlet tubes, drawing them out to capillary point and closing by fusion. The flask is then heated on a water bath for one hour, then cooled and the bent tube connected (by means of a capillary connection) with a calcium chloride tube, and this in turn with a CO_2 absorption apparatus.

The capillary end of the inlet tube is now broken off to permit the CO_2 (which is under low pressure) to pass over. The CO_2 left in the solution is then recovered by heating the flask slightly and passing through the straight inlet tube CO_2 free air for one hour. The amount of CO_2 collected in the absorption apparatus is then weighed and the CH_3OH calculated therefrom.

To estimate the amount of acid used, the solution in the flask is now diluted to 500 mils and 50 mils of this titrated with sodium thiosulphate in the usual manner and the amount of CH_3OH calculated according to the formula above. Tables of results of different experiments are given which show that accurate results were obtained and that one method of estimation can be used as control for the other.

This method may also be used for the estimation of cocaine in aqueous solution as cocaine if heated with acids and alkalies is composed into ecgonin, benzoic acid and methyl alcohol. The latter is then estimated according to the process given above and the amount of cocaine calculated therefrom. Full details of the working process and tables showing the results of different experiments are given, and the fact is mentioned that potassium hydroxide seems to saponify the cocaine more rapidly than barium hydroxide, which is commonly used.

Further experiments are given explaining the estimation of methyl alcohol in the presence of ethyl alcohol and factors for calculations are given.—Pharm. Zent., 61 (1920), 361. (O. M.)

Methyl Alcohol.—*Detection in Hair Tonics.*—For detecting wood alcohol in hair tonics, dilute 50 mils of the tonic with 150 mils of water and distil 90 mils from the mixture to which calcium chloride or sulphuric acid has been added when the preparation contains soap. Ten mils of water are then added to the distillate and the liquid is shaken out with 50 mils of petroleum ether in order to remove ethereal oils and fats. After complete clearing of the liquids has taken place, the aqueous layer is drawn off and of each 50 mils, one mil is distilled off, oxidized and tested for formaldehyde in the usual way.—Pharm. Ztg., through Drug. Circ., 64 (1920), 382.

Methyl Alcohol.—*Differentiation from Ethyl Alcohol.*—Para bromobenzoyl chloride reacts on methyl alcohol in the presence of caustic soda solution with the formation of para bromobenzoic acid methyl ester, a crystalline substance, melting at 78° to 79° and possessing a strong odor of anise.

$C_6H_4Br\ CO\ Cl + CH_3OH + Na\ OH = C_6H_4Br\ COO\ CH_3 + H_2O + Na\ Cl.$

W. Authenrieth utilizes this reaction for detecting methyl alcohol in beverages, etc. To the liquid under examination 10 per cent. caustic soda solution is added and the mixture is heated in a stoppered bottle with an excess (about 8 per cent.) of para bromobenzoyl chloride at 40° to 45° for about five minutes with thorough shaking. In the presence of methyl alcohol, the ester separates in the form of a white powder, which is collected, recrystallized from alcohol, methyl alcohol or acetone and identified by its melting point. It may also be converted into the amide which melts at 188°. Ethyl alcohol forms under the same conditions an ester also, but this ester is a liquid and does not become solid even when cooled to 16°. The author was able to detect methyl alcohol in a liquid containing 0.2 per cent of this alcohol and 0.8 per cent of ethyl alcohol. In order to detect methyl alcohol in a mixture with ethyl alcohol, it is advisable to separate the former as much as possible by fractional distillation. The method can also be used for detecting methyl alcohol in urine. For this purpose the urine is first distilled in the presence of phosphoric acid in order to bind ammonia and the distillate is redistilled in the presence of caustic soda solution to eliminate any phenols. By this method the presence of

methyl alcohol could be proven in corpses which had been buried for more than a year.—Arch. Pharm. (H. E.) through Pharm. Weekbl. 57 (1920), 744.

A. O. Gettler presents a critical study of 58 tests for the detection of methyl alcohol, 46 being based on the oxidation of the alcohol to formaldehyde and the subsequent detection of this compound, and twelve applied directly to the alcohol after suitable isolation. Of the first series the author recommends five colorimetric tests which can be used to detect one part in 200,000, and two tests in which crystalline products are obtained, these being less sensitive but used for confirmation. The second group of tests require considerably more alcohol and only two are recommended. Full details of manipulation and a very full bibliography are given in the paper—J. Biol. Chem., through J. Soc. Chem. Ind., 39 (1920), 613 A.

P. Hasse gives details in regard to carrying out some methods recommended for the detection of methyl alcohol. The alcohol or alcoholic distillate after being diluted with water in such a way that it does not contain more than 5 per cent. of alcohol, is oxidized with potassium permanganate in the usual way, etc. For the identification of the formaldehyde he recommends adding to each 0.5 mil of the liquid one drop of peptone solution which contains in each drop 2.5 mgms. of peptone and one mil of sulphuric acid containing iron and prepared by dissolving 0.05 grams of iron-alum in one mil of water and adding to the solution 300 grammes of concentrated sulphuric acid. In the presence of 0.3 per cent. of methyl alcohol a reddish-blue color is produced while with 1 per cent. of methyl alcohol a deep-blue color is obtained. The reaction with Marquis' reagent (solution of 0.1 gramme of morphine hydrochloride in 10 mils of concentrated sulphuric acid) is best carried out by adding to 0.1 mil of the formaldehyde solution 1 mil of the iron-sulphuric acid and one drop of the reagent. When 5 per cent. or more of methyl alcohol is present in the liquid under examination a green color is produced in the mixture, the color changing rapidly to blue, then to violet and finally (after about 5 minutes) to red. The reaction with fuchsin-sulphurous acid is made by adding to one mil of the liquid one mil of the fuchsin-sulphurous acid and two mils of water. In the presence of 1 per cent. or more of methyl alcohol an intense red color is produced within two hours. This test has the disadvantage in that 4 per cent. or more of acetaldehyde produces a reddish color also, but the color disappears within

about 1½ hours. The reagent is made by dissolving 0.5 gramme of fuchsin in 90 mils of water and one mil of sulphuric acid, adding to the solution a solution of 0.5 gramme of sodium sulphite in 10 mils of water and allowing the mixture to stand over night.—Pharm. Zent., 61 (1920), 177. (H. E.)

J. W. E. Harrison points out that in conducting the U. S. P. test, the temperature is an important factor. If the test is carried on below 21°, formaldehyde will not be generated; if about 25°, ethyl alcohol will be partly oxidized to acetaldehyde. Harrison recommends for quick work the following modification of the Hinckle method:

All samples containing sugar, glycerin or volatile oils must be previously distilled and amount preferably being taken that will produce an alcoholic content of not less than ten per cent. in the distillate. A quantity of the distillate is taken that will approximately equal one mil of absolute alcohol and placed in a small flask, 8 grammes of ammonium persulphate is added and three mils of 20 per cent. sulphuric acid, the volume is then made up to twenty mils with distilled water. The addition of a few small glass beads will prevent bumping during distillation. The first four mils of distillate are collected in a small tube and then three two mils portion in separate tubes.

Formaldehyde may now be detected very readily if there has been at least one per cent. methyl alcohol in the original alcohol by the use of the phenylhydrazine-ferricyanide or the phenylhydrazine-nitroprusside reactions.—Proc. Pa. Pharm. Assoc., 43 (1920), 294.

Owing to the use of wood alcohol in beverages, renewed interest has been aroused in the tests for this substance. In discussing the oxidation tests in which heated copper is used, J. L. Mayer calls attention to the fact that these procedures, while simple, are not reliable and that the Trillat, Riche and Bardy and refraction tests are too complicated for the average pharmacist. A modification of the Hinkel test is suggested. Details of this test are as follows: To one mil of the suspected fluid, 0.8 gramme of ammonium persulphate, 3 mils twenty per cent. sulphuric acid and 16 mils of water are added and the mixture is distilled. The first four mils of distillate are rejected and three succeeding portions of two mils each are collected separately. A few drops of one per cent. morphine sulphate solution are added to each portion of distillate and the mixture is underlayered with concentrated sulphuric acid.

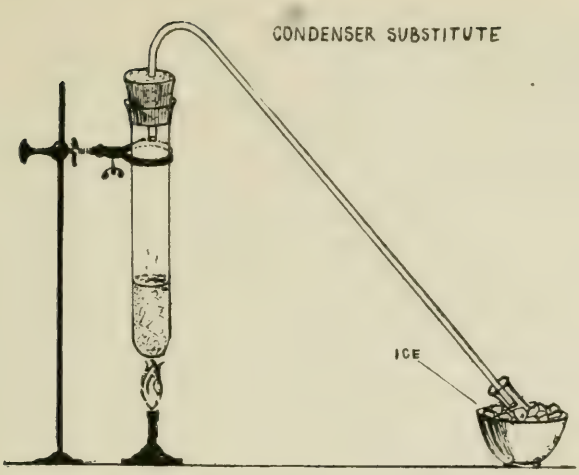


FIG. 23.

Methyl alcohol is indicated by a violet ring at the point of contact within ten minutes. If a water cooled condenser is not available, good results may be obtained by connecting the distilling flask with a long glass tube properly bent and extending to a test-tube placed in ice water, as shown in the accompanying picture (Fig. 23).—Pharm. Era, 53 (1920), 73. (C. W. B.)

Copper sulphate is soluble in anhydrous methyl alcohol producing a blue solution, while it is insoluble in ethyl alcohol; the presence of a small amount of water, however, destroys the blue color and the color does not reappear until the amount of water is increased to 35 per cent. Ethyl alcohol diluted with the same amount of water dissolves copper sulphate also, and the test, according to Pannwitz, therefore, can not be used for distinguishing these two alcohols.—Pharm. Zent., through Drug Circ., 64 (1920), 102.

T. Sabalitschka agree with Pannwitz that the copper sulphate test is useless in the presence of water. The test may, however, be of some use for the detection of methyl alcohol in absolute alcohol. —Pharm. Zent., through J. Soc. Chem. Ind., 39 (1920), 245A.

When the alcohol under examination is oxidized in the usual way, and when the distillate is tested for formaldehyde with morphine-sulphuric acid, no reliable results are obtained if the alcohol contains higher alcohols, because these yield, on oxidation, products which give the same reaction with morphine-sulphuric acid as formaldehyde. When, however, apomorphine-

sulphuric acid is used as the reagent, Wolff finds that only formaldehyde gives a bluish-violet coloration, while propyl alcohol, amyl alcohol, etc., yield products which give a yellow or red-brown color.—Chem. Ztg., through Drug. Circ., 64 (1920), 217.

Methyl Alcohol.—*Production of.*—Since the war, wood alcohol and acetate of lime have been made from sawdust, which is ordinarily a waste product, instead of from valuable wood. Sawdust and wood waste from oak, maple, hickory, beech, ash and other hardwoods are formed into small cakes, and to them is applied a pressure of many tons to the square inch. The resulting cakes of wood are then carbonized by heating in special ovens under careful control of heat and pressure, thereby varying the product to suit the demand. A solid residue of carbon or charcoal remains, while the volatile products, such as acetic acid, methyl alcohol, phenols, benzene, napthalene and others, which were vaporized, are condensed under suitable conditions. The condensed mixture is then neutralized with lime, forming acetate of lime with the acetic acid, and the remaining products are separated by redistillation. The charcoal is used as fuel. —Merck's Rep., 29 (1920), 57.

Methyl Alcohol.—*Pharmacology of.*—The dangers of wood alcohol to human health, though known for some time to physicians, has never been fully realized by the public. With the coming of national prohibition, however, it behooves those who know of its dangers to actively inform the public of the possibility of criminal adulteration of alcoholic beverages with wood alcohol. When death occurs from the ingestion of this substance, there is usually coma, with death from respiratory paralysis. According to our present knowledge, methyl alcohol is eliminated slowly from the body, an end-product of the oxidation in the body being formic acid. Formic acid has been recognized as an excretory product of methyl alcohol since Pohl demonstrated, in 1895, that introduction of this alcohol into the stomach leads to an increased output of formic acid in the urine. This latter fact makes it possible of ascertaining whether or not wood alcohol has been taken into the organism. A mere qualitative test for formic acid is not sufficient, however, as this

acid has been known since 1877, to be a normal constituent of the urine. Of course the output varies, but a person living on a fairly uniform diet eliminates approximately 0.25 grammes a day. When wood alcohol is ingested the amount promptly increases. A person taking 80 grammes of pure methyl alcohol in the course of eight days shows an extra elimination of formic acid above his usual output equivalent to 5 per cent. or more of the consumed spirits.—Am. J. Pharm., 92 (1920), 126. (J. K. T.)

Methyl Alcohol.—*Prohibition and.*—Charles Baskerville dwells briefly upon the history of wood alcohol, beginning with Boyle, 1661, to the present time, also touching upon the various sources and methods of production and purification. Methyl alcohol has been known in the market under many trade names. "The legitimate uses of methyl alcohol may be grouped as follows:—

A—for denaturing ethyl alcohol.

B—In the chemical industries; (1) as a solvent (fats, varnishes, moving picture films, etc.), (2) as an extraction agent (explosives), (3) as raw material for production of formaldehyde, (4) in synthetic chemistry for introduction of the methyl (CH_3) group (perfumes, flavors, dyes, etc.), (5) as a reagent in the laboratory.

C—In pharmaceutical and medicinal preparations. (Surgical dressings, cattle medicines, etc.)

D—In the arts and crafts (manufacture of incandescent mantles, of hats, furniture, pianos, burial caskets, boats, shoes, etc.).

E—Unclassified (fuel, illuminant, cleaning fluid, etc.)

Dr. Baskerville recommends that a change in the nomenclature of the alcohols should be made. Methyl alcohol would then become known as methyl hydroxide or menthanol and as such it is now extensively advertised.

Methanol is used largely as a denaturant and as such, is used both legally and illegally. There are about 40 formulas for "specially denatured alcohol" and their uses are very strictly

controlled. "Deodorized" methanol has been used as an adulterant in whiskies, essences, fluidextracts, perfumes, etc. The drinking of liquids containing methanol has been responsible for many cases of blindness and deaths which are becoming less, due to the education of the public.—Pharm. Era, 53 (1920), 181. (H. M.)

Myricyl Alcohol.—*Formula of.*—A. Gascard, from his work with myricyl iodide, has decided that the formula of myricyl alcohol is $C_{31}H_{64}O$ and not $C_{30}H_{62}O$ as stated by Brodie. Gascard finds that the alcohol melts at 87°.—Compt. rend., through J. pharm. chim., 22 (1920), 194.

Nitroglycerol—*Determination of.*—H. D. Richmond recommends the following method for the analysis of commercial nitroglycerol solutions (such as spirit of nitroglycerin): Five mils of the sample are mixed with 50 mils of water and titrated with N/10 barium hydroxide solution. After deducting 0.1 from the number of mils of alkali solution used, the result is divided by 1.02 (correction for slight hydrolysis). To determine the nitroglycerol, 5 mils of a 10 per cent. solution plus 5 mils of 90 per cent. alcohol (or 10 mils of a 5 per cent. solution) are treated with 25 mils of N/2 alcoholic sodium hydroxide solution; 10 mils of the latter solution are required for 20 mils of a 1 per cent. nitroglycerol solution. After 5 minutes phenolphthalein is added, and the excess of alkali titrated with N/1 acid. If more than 4 mils of acid are used, the determination must be repeated, increasing the alcoholic strength, since the final solution must contain at least 81 per cent. of alcohol. The volume of alkali solution used is corrected for the acidity as found above; then 1 mil of N/1 alkali solution is equivalent to 0.05675 gramme of nitroglycerol. If 2 mils of "100-vol." hydrogen dioxide are added before the addition of alkali, the final alcoholic strength has much less influence on the titration.—J. Soc. Chem. Ind. 39 (1920) 640A.

Paraldehyde.—*Assay of Acetaldehyde in.*—W. Stüwe gives the following method: Into a measuring flask of 100 mils contents, containing 10 mils of N/10 corrosive sublimate solution and 2 grammes of potassium iodide (free from iodate), 20 grammes of 15 per cent.

caustic soda solution, 50 grammes of water and 5 mils of the paraldehyde solution are placed. The mixture is allowed to stand with frequent shaking for 15 minutes. Sufficient water is then added to obtain 100 mils and when the mercury has settled on the bottom of the flask, the mixture is filtered. Then, to 50 mils of the filtrate .5 gramme of acacia is added, then 5 mils of caustic solution and 3 mils of formaldehyde solution. After allowing the liquid to stand for a few minutes, 15 mils of diluted acetic acid are added and then 10 mils of N/10 iodine solution. The mercury is dissolved by shaking the mixture, and then the excess of iodine is titrated back with N/10 sodium thiosulphate solution. Each mil of N/10 iodine solution consumed corresponds to 2.2 mgms. acetaldehyde.—Apoth. Zeit., through Pharm. Weekbl. 57 (1920), 891. (H. E.)

Paraformaldehyde.—*Destruction of Mosquito Larvæ with.*—Trioxymethylene (or paraformaldehyde) is a possible substitute for crude petroleum in the war on mosquito larvæ and has the advantage that it does not render the water unfit for cattle. The efficacy of the powder is due to the habits of the larvæ which feed at the surface and ingest the fine particles. The powder should be very fine and be uniformly scattered when the water is still. The amount needed is only 0.25 gramme to a sq. meter. Action is specific to the *Anopheles* larvæ, other organisms being unaffected. Several applications are needed at intervals of a few days as the powder is soon dissolved and only larvæ at a certain stage are killed. Evening and early morning are the best times for application.—Compt. rend. through Pharm. Era, 53 (1920), 333.

Propyl Alcohol.—*Production from Petroleum Waste.*—A process of utilizing the waste gases resulting from the cracking of petroleum is being worked on a commercial scale. These gases contain considerable quantities of propylene, and after having been freed from hydrogen sulphide, are caused to pass through sulphuric acid, when, after distillation, propyl alcohol is obtained. A number of esters of commercial importance are also being produced, as well as acetone. It is proposed to call the alcohol *"petrohol,"* and it is to be exploited as a substitute for "methanol" as a solvent for resins. The capacity of the plant at present is 250 gallons per day. (G. C. D.)

Propyl Alcohol.—*Use as Alcohol Surrogate.*—G. Blunck describes the technical production of propyl alcohol from raw spirits. It is done by redistillation, the fusel oil fraction consisting of 4 to 7 per cent. of propyl alcohol, 15 to 30 per cent. of isopropyl alcohol and 65 to 80 per cent. of amyl alcohol. By careful rectification of the crude fusel oil (between 85 and 100°) the two propyl alcohols are separated from the amyl alcohol, the last traces of the latter being removed by shaking out the propyl alcohols with alkali and then distilling the propyl alcohols from the alkaline solution. Blunck points out that while propyl is as good a solvent for oils and perfumes as ethyl alcohol, it must aways be remembered that it is poisonous.—Drogenhändler, through Pharm. Zent. G (1920) 577.

Sulphonal and Trional.—*Tests for.*—Zimmerman discusses the Sailer method for determining the presence of methyl groups, by conversion into methyl salicylate finding that the method is a practical one. At the same time the presence of the mercaptan group is demonstrated by its odor. The test is carried on as follows: About 0.10 gramme of sulphonal or trional is heated in a test tube with the same amount of sodium salicylate. The odor of mercaptan is at once noted. After cooling, add 5 drops of ethyl alcohol and 5 drops of strong sulphuric acid to the fused mass, heat gently and add a further 5 drops of the acid. The mixture will now have assumed a Bordeaux-red color and will present a turbid appearance. After the lapse of a few minutes the odor of methyl salicylate will be in evidence. This will be especially noticeable if the contents of the test tube be poured into an evaporating dish. The residual material will now have assumed a violet or a brown-violet color. Zimmerman proposes that this test and others be incorporated in the Arznei Buch. A similar test was applied in the case of acetanilid, antipyrine phenacetine, veronal and santonin, but in no instance was the violet color observed. Veronal yielded a brown residue, while santonin yielded a carmine-red residue.—Apoth. Ztg., through Pharm. Ztg., 63 (1920) 264. (G. C. D.)

AROMATIC DERIVATIVES

Antipyrine.—*Combination with Benzoic Acid.*—Kremann and Marktl report that antipyrine and benzoic acid when melted together

form a single equimolecular compound, melting at 66°. This compound forms eutectics with antipyrine containing 63.5 per cent. of antipyrine at 59.5°, and with benzoic acid containing 50.5 per cent. of antipyrine at 59.5°.—Monatsh. Chem., through J. Soc. Chem. Ind., 39 (1920) 557A.

Arsenobenzol.—*Assay of Amino-oxyphenylarsenous Oxide in.*—H. Cousin points out that arsenobenzol upon standing in contact with air, is partially converted into amino-oxyphenylarsenous oxide, C_6H_3 (AsO) (NH_2) (OH). This product according to Ehrlich is 20 times more toxic than arsenobenzol and explains the occasional toxicity of old salvarsan samples.

Cousin has devised the following assay based upon the fact that the base, amino-oxyphenylarsenous oxide is soluble in water, whereas pure arsenobenzol is insoluble.

One gramme of the sample is dissolved in 10 mils of methyl alcohol in a glass-stoppered bottle. The solution should be perfectly clear (amino-oxyphenylarsenous oxide dissolves with opalescence). To this solution 1.50 grammes of calcium carbonate are added, the fluid is brought up with water to 100 mils and is filtered. To 50 mils of the filtrate are added 75 mils of water, 5 mils of normal hydrochloric acid, a few drops of starch paste and the mixture is then titrated with N/20 iodine V. S.

While a pure sample of arsenobenzol should not contain more than 0.8 per cent. of soluble arsenous oxide, Cousin found 12 old samples that contained 2.43, 2.3, 1.38, 1.09, 2.6, 3.2, 1.9, 1.2, 1.5, 1.5, 1.5 and 1.2 per cent., respectively. This assay is not applicable to neosalvarsan, since that substance is not completely precipitated by calcium carbonate.—J. pharm. chim., 22 (1920), 390.

Arsphenamine.—*Composition of.*—At a meeting of the Chemical Society, Pyman and Fargher discussed this subject, pointing out that commercial salvarsan, prepared by the reduction of 3-nitro-4-hydroxy-phenyl-arsenic acid by means of sodium hyposulphite, solution of the 3:3¹-diamino-4.4¹-dihydroxyarsenobenzene so obtained in methyl alcohol containing hydrogen chloride, and precipitation of the salt by means of ether, is generally regarded as 3:3¹-diamino-4:4¹-dihydroxyarsenobenzene dihydrochloride containing combined sol-

vent. The latter, according to the earlier work of Ehrlich and Bertheim, is methyl alcohol, and it has been suggested recently by Kober that the variable toxicity of salvarsan can be accounted for on this assumption. On the other hand, the circulars of the first makers, the Farbwerke vorn. Meister Lucius u. Brüning, suggest that the combined solvent is water. It has now been shown that the retained solvent consists almost entirely of water, support for the view being adduced from the elementary analysis of salvarsan and direct estimation of methyl alcohol, the amount present varying from nil to 1.4 per cent. The replacement of ether by acetone in the precipitation leads to a product which, in addition to the customary solvent, which can be removed in a vacuum, contains a molecular proportion of acetone.

It was originally indicated by Ehrlich and Bertheim that the crude base from the hyposulphite reduction contained sulphur attached to arsenic, which was removed by conversion into the hydrochloride. The authors found, however, several years ago that commercial salvarsan of both British and German origin invariably contained sulphur, the amount varying generally from 1 to 2 per cent. As the result of a comprehensive series of experiments, it was concluded that at least a portion of the sulphur was present in acidic form, most probably as a sulphaminic acid, $R.NH.SO_3H$, and a product closely approximating in composition to the hydrochloride of the monosulphaminic acid of salvarsan $(HCl, NH_2)(OH)C_6H_3As_2C_6H_3(OH)(NH.SO_3H)$, was actually isolated. The presence of this product, which could be estimated quantitatively with some degree of accuracy, did not, as a rule, account for the whole of the sulphur, and evidence was given in support of the assumption that a proportion of the remainder was attached to arsenic. It was also suggested that owing to the fact that salvarsan possessed some of the properties of a colloid, sulphur might be present merely in physical association. The last section of the paper dealt with the preparation of pure diamino-dihydroxy-arsenobenzene dihydrochloride, the most satisfactory process being the reduction of 3-amino-4-hydroxyphenylarsinic acid with hypophosphorus acid. It is interesting to record that a specimen of this pure material tested by the Medical Research Committee proved to be more than normally toxic.—Pharm. J., 104 (1920), 306.

Arsphenamine.—*Examination of.*—According to Utz, salvarsan preparations may be conveniently identified by Gaebel's reaction, according to which this compound gives the diazo reaction with α-naphthylamine, but not with β-naphthylamine. Salvarsan and neosalvarsan can be distinguished from one another by the following reactions: 5 mils of neosalvarsan solution (1:1000) with 0.1 mil of dilute hydrochloric acid gives a precipitate, soluble on boiling and not re-precipitated on cooling. Salvarsan gives no such precipitate. With an equal volume of acetic acid neosalvarsan solutions give a cloudiness changing to an orange-colored precipitate on heating, whilst salvarsan give a negative result. With ferric chloride both preparations give a green to red coloration, and with excess the salvarsan solution becomes dark red, and neosalvarsan violet. Mercuric chloride gives with salvarsan a heavy white precipitate, and with neosalvarsan an orange precipitate, both of which become somewhat grey or dirty on heating and rapidly sink to the bottom. Ammonium molybdate yields with salvarsan an olive-green precipitate and with neosalvarsan an olive coloration becoming dark-green, but no precipitate. Platinic chloride gives only with neosalvarsan a flocculent precipitate which gradually settles. Picric acid produces with salvarsan solutions an intense yellow precipitate which is not dissolved on heating, whilst with neosalvarsan only a slight opalescence is produced after long standing. On the addition of a concentrated solution of sodium bisulphite the yellow salvarsan solution immediately becomes greyish-green, followed by a dirty grey cloudiness; on warming, the liquid becomes first green and then yellow, and finally a lemon-yellow precipitate is formed. Neosalvarsan gives no reaction with this reagent.—Süddtsch. Apoth. Ztg., through J. Soc. Chem. Ind., 39 (1920), 526 A.

Arsphenamine.—*Rubber Tubing a Cause of Contamination of.*—Stokes and Busman report that a certain widely distributed brand of so-called pure gum rubber tubing seems to contain, when new, a toxic agent responsible for a definite type of reaction following the intravenous administration of arsphenamine and, possibly, also of alkaline solutions and transfusion media. The toxic substance is apparently removable by soaking the tubing for six hours in normal sodium hydroxide solution and rinsing.—J. Am. Med. Assoc., 74 (1920), 1013. (W. A. P.)

Arsphenamine.—*Silver Compound of.*—Ehrlich and Kolle have experimented exhaustively with silver salvarsan, and have found it to be more than twice as efficacious, in indicated cases, than is salvarsan itself, though it contains only 22.40 per cent. of arsenic, against 34 per cent. contained in salvarsan. In experimenting upon animals, Kolle reports results as follows: Efficacious dose of silver salvarsan per kilogramme of animal weight, 0.004 gramme, of salvarsan, 0.01 gramme. Disappearance of spirochetae after 24 hours in case of silver salvarsan, and only after 72 hours in case of salvarsan. The salt is obtained by interaction between solutions of silver nitrate and diamino-dioxy-arseno-benzol hydrochloride. Binz, Bauer, and Hallstein report their results after exhaustive experimentation with the compound. Among others it was found that 1 molecule of salvarsan reacts with 2 molecules of silver nitrate. Silver salvarsan is soluble in water, the solutions being described as semi-colloidal in nature.—J. Soc. Chem. Ind., 39 (1920), 348 A. (G. C. D.)

According to a report of the Medical Research Committee of Great Britain, silver salvarsan is apparently a molecular combination of arsphenamine and silver in some form. The substance is on trial, and its promiscuous use at this time would be ill advised. In the United States no license for the sale of silver salvarsan has been granted by the Treasury Department and hence it may not be sold in interstate commerce.—J. Am. Med. Assoc., 75 (1920), 626. (W. A. P.)

Arsphenamine.—*Test for Arsenic in.*—According to Utz, there is considerable adulteration of salvarsan and neosalvarsan in Germany and he suggests that every pharmacist should be prepared to test these products rapidly and accurately to detect spurious samples. He calls attention to the fact that a solution of salvarsan and neosalvalsan gives no precipitate of arsenic when acidulated with hydrochloric acid and heated with hydrogen sulphide and then reviews the various standard arsenic tests and their value in identifying salvarsan. He considers these all more or less unsatisfactory for the apothecaries' use and finally outlines a number of methods which have yielded good results in his hands. Of these, the following is described as the most rapid and certain, requiring only five minutes and a very small quantity of sample: To 0.05 gramme of the sample, add 15 drops of concentrated sulphuric acid, dissolving with aid of gentle

heat. Add ammonium persulphate in minute portions, permitting the oxygen generated by the reaction to escape before each addition, until the reddish brown solution finally becomes colorless. Heat the solution and then allow to cool and precipitate the arsenic with the aid of zinc chloride solution or with hydrogen sulphide after acidulating with hydrochloric acid and heating.—Pharm. Zent., 61 (1920), 39. (R. P. F.)

Arsphenamine.—*Toxicity Increased by Shaking in Air.*—Roth has determined that if an alkalized solution of arsphenamine or a solution of neoarsphenamine is shaken in the presence of air for one minute, the toxicity is increased. He points out that arsphenamine preparations which are soluble with difficulty are likely to be shaken to aid in the solution of the drug with the risk that chemical reaction may occur.—J. Am. Med. Assoc., 75 (1920), 1072. (W. A. P.)

Arsphenamine.—*Use in Non-Syphilitic Diseases.*—Reasoner and Nichols report that arsphenamine and neoarsphenamine act as specifics in Vincent's angina, relapsing fever, yaws, gangosa, and pulmonary spirochetosis (if given early in man, and in equine influenza). A therapeutic effect is noted in rat-bite fever, in certain dental conditions, and in fowl spirochetosis. No apparent beneficial effect is found to follow their use in other non-syphilitic spirocheta disorders, such as Weil's disease and yellow fever. Good results have been obtained with syphilitics in a number of non-syphilitic conditions which are adversely affected by syphilis. There is a limited effect on certain protozoal diseases, as malaria and some trypanosomiases and leishmaniasis. It is possible that this effect may be non-specific. With the exception of anthrax, and possibly glanders, few favorable results are reported in bacterial diseases. Their use has been recommended in conditions in which arsenic is indicated; but in these the effect is alterative rather than specific; and ordinarily they show no advantage over Fowler's solution in such cases.—J. Am. Med. Assoc., through Pharm. J., 105 (1920), 323.

Arsphenamine.—*Use of.*—Many therapeutic perplexities remain after nearly a decade of trial of the type of compound which Ehrlich introduced. It is well for the practitioner to realize this, especially when expert workers still make an appeal for conservative interpretation. Arsphenamine has apparently made it possible or even probable, but only to the inexperienced has the cure of syphilis been

made absolute and inevitable. Even the composition of arsphenamine and neoarsphenamine is not fully known, and the control of the products by the government is important. It should be borne in mind also that neoarsphenamine behaves differently in the animal organism from arsphenamine, and should not be regarded simply as arsphenamine in a convenient form for administration. The various brands of arsphenamine and neoarsphenamine made in the United States compare favorably as to toxicity with those made abroad.—J. Am. Med. Assoc., 75 (1920), 1005. (W. A. P.)

Neoarsphenamine.—*Adulterated.*—Bohny and Fleissig report that a sample containing no arsenic consisted of 33 per cent. sodium chloride, 66 per cent. sand and was colored yellow with ocher. Four similar cases on record are quoted.—Schweiz. Apoth. Ztg., 58 (1920), 521. (H. A. L.)

Neoarsphenamine.—*Arsenic Assay of.*—Kircher and Von Ruppert describe a method of arsenic determination as follows: 0.2 to 0.3 gramme of sample is weighed into a special flask (Fig. 24)

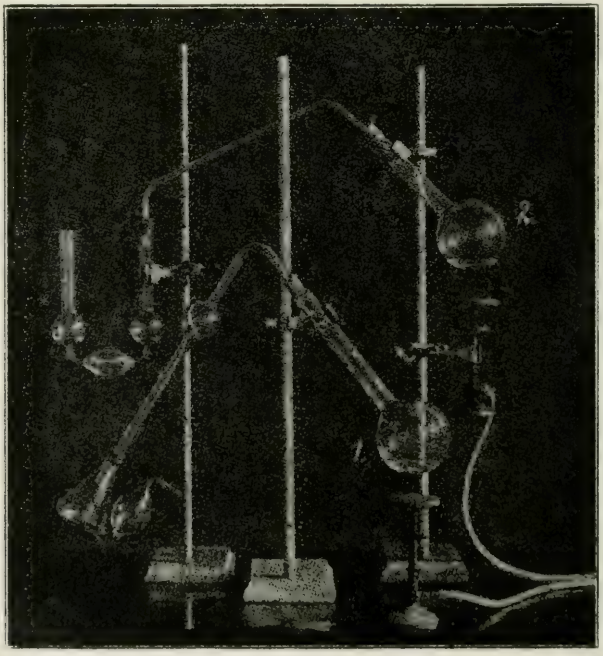


Fig. 24

and 20 mils of sulphuric acid and 15 grammes of potassium sulphate are added. Heat for two or three hours until the solution is colorless. Add water and boil for five minutes to remove sulphur dioxide. Now add 48 mils of 30 per cent. sodium hydroxide solution and then to the still strongly acid mixture add iodine solution drop by drop until slightly in excess, using a starch solution as indicator in order to remove the last traces of sulphur dioxide. Decolorize with a drop of thiosulphate solution. Now wash the solution into a flat bottomed flask, saturate with powdered sodium bicarbonate and titrate with N/10 iodine solution. 1 mil N/10 iodine solution = .003748 Gm. arsenic. A blank should be run and suitable correction made.—Ber. Dtsch. Pharm. Ges., 30 (1920), 419. (H. H. S.)

Neoarsphenamine.—*Effect of Aging.*—Verda took a certain 500 gramme specimen less than 2 years old in the original bottle from a foreign military store and compared it with two fresh authentic ampulled samples. It was almost insoluble in water and in sodium hydroxide solution; in melting point and microscopic characters it also showed decomposition, thus being unfit for medical use. The fresh samples decomposed at about 250°; when exposed to the air for ten days they changed color from bright yellow to orange red, but retained their solubility in water and were precipitated by acids, redissolved by alkali. The time limit of activity should be declared on the label so as to prevent poisoning.—Schweiz. Apoth. Ztg., 58 (1920), 250. (H. A. L.)

Arseno-Organic Compounds.—*Aromatic Arsinic Acids.*—H. Schmidt prepares aromatic arsinic acids by the action of diazonium solutions on sodium arsenite. The most favorable conditions for the production of phenylarsinic acid and many of its nucleus substitute derivatives are secured when the alkalinity of the solution is so regulated that action can occur in accordance with the scheme: $ArN_2Cl + AsO_3HK_2 = KCl + Ar.As(O_3HK) + N_2$. In this manner, *o*-nitrodiazobenzene gives about 90 per cent. of the theoretical quantity of *o*-nitrophenylarsinic acid, but the amounts of arsenic-free by-products (azo-compounds, etc.) are more considerable in the cases of many other arsinic acids. In more strongly alkaline solution the reducing action is more generally noticeable and the yields of arsinic acids are lower. Poorer yields are also observed with diazobenzene in acid solution, but an acid medium is favorable when

strongly acidic substituents are present in the benzene nucleus. In addition to the well-known arsenic-free by-products, others containing arsenic can be isolated, the chief of which is phenylphenylenearsinic acid, $C_6H_5.C_6H_4.AsO_3H_2$.—Ann., through J. Soc. Chem. Ind., 39 (1920), 763A.

Arseno-Organic Compounds.—*Diphenylcyanarsin.*—This body, $(C_6H_5)_2AsCN$, has been obtained by Sturniolo and Bellinzoni as colorless, prismatic plates, melting at 35°, soluble in alcohol, ether, benzene, chloroform and ligroin, but insoluble in water. When treated with strong nitric acid and 2 per cent. hydrogen dioxide in the cold, $C_6H_5As{=}O$ diphenyl arsenic acid, $C_6H_5As{-}H$, is obtained.—Boll. chim. pharm., through Pharm. Zent., 61 (1920), 644.

Arseno-Organic Compounds.—*Monarsone.*—This is a shortened name for monoethylarsone, $CH_3CH_2AsO(NaO)_2$. B. L. Wright finds it of value in syphilis.—Prescriber, through Am. J. Pharm., 92 (1920), 837.

Arseno-Organic Compounds.—*Novarsenobillon.*—Injection of a mixture of 0.45 gramme of novarsenobillon and 2 mils of a 1 per cent. solution of mercury bichloride have been given by Dr. Reginald Johnson with excellent results. The solution is injected into the vein in the usual way. The chief advantages of the combined use as stated by Johnson are: (1) The mercury gets into the circulation and there is no fear of abscess, pain, or limping; (2) lesions clear up more quickly than when using the drugs separately—*i. e.*, intravenously and intramuscularly; (3) stomatitis has not occurred in his experience; (4) at the completion of the course the blood was negative in 95 per cent. of the cases.—Brit. Med. J., through Chem. & Drug., 92 (1920), 748.

Arseno-Organic Compounds.—*Phenylarsenic Acids.*—K. G. Fargher estimates the arsenic in these acids as follows: 200 mgms. of the material are mixed in a flask of 250 mil contents with one gramme of potassium permanganate and 5 mils of 50 per cent. sulphuric acid and after the first violent reaction has subsided, 10 mils of concentrated sulphuric acid is added, followed after a few minutes by 10 mils of water and the mixture is gently boiled for 30 minutes.

The manganese dioxide is removed by adding a slight excess of hydrogen dioxide solution, 30 mils of water are added and the mixture is boiled again for 10 minutes. After the addition of a slight excess of potassium permanganate solution and then removing the excess of permanganate by adding a few drops of oxalic acid solution, 25 grammes of potassium iodide are added to the liquid and after allowing it to stand for one hour, the liberated iodine is titrated with n/10 sodium thiosulphate solution. Each mil of the latter corresponds to 3.75 mgms. of arsenic. It is advisable to run a blank test.—Journ. Chem. Soc. Trans., through Pharm. Weekbl., 57 (1920), 430. (H. E.)

Organo-Arsenic Compounds.—*Condensation of Primary Arsines with Aldehydes.*—Adams and Palmer summarize their work of this character by calling attention to the fact that phenylarsine has been condensed with butyraldehyde and benzaldehyde producing compounds consisting of two molecules of aldehyde and one of arsine and probably having the following structure, $C_6H_5As(CHOH)_2R$.

The condensation products are stable toward dilute acid, alkali and water.—J. Am. Chem. Soc., 42 (1920). (J. L. M.)

Arseno-Organic Compounds.—*Sulfarsenol.*—Some interesting comparisons of the new arsenical, sulfarsenol, with salvarsan and neosalvarsan have been made. While more active than neosalvarsan, experiment has shown that 25 centigrammes are required to produce the same toxic effect as 8 to 10 centigrammes of neosalvarsan. Statistics confirm this for 300,000 injections have been made without a fatality, while deaths from neosalvarsan were one to 54,000 in 1919 and one to 18,000 in 1912. The new product is much more stable. A solution of neosalvarsan exposed to the air for twenty-four hours is fatal if injected, while a similar solution of sulfarsenol exposed in the same way is not appreciably changed and may be used with impunity. Moreover there are indications that sulfarsenol has a favorable effect on certain tropical diseases. All these facts would appear to justify the claim that "sulfarsenol is the arsenical of the future."—J. Pharm. Belge, through Pharm. Era, 53 (1920), 333.

Arylstibinic Acids.—H. Schmidt finds that the action of diazo compounds on antimony oxide is similar to that with arsenous acid, nitrogen being copiously and spontaneously evolved and arylstibinic

acids formed. The difficulty of retaining antimony oxide in solution with a little alkali can be surmounted by the use of potassium antimonyl tartrate and other soluble antimony salts or by the use of freshly precipitated hydrated antimony oxide which need not be completely dissolved. Reaction can frequently be effected in strongly alkaline solution, but when markedly acidic substituents are present in the benzene nucleus it is frequently preferable to operate in a neutral or acid medium. The arylstibinic acids are derivatives of polymeric antimonic acids (*c. g.,* phenylstibinic acid $OH.SbC_6H_5(:O).O.SbC_6H_5(:O).O.SbC_6H_5(:O).OH$), which under the action of alkali and water yield the alkali salts of monomolecular arylstibinic acids, the latter, however, readily re-polymerising when liberated. They have pronouncedly colloidal properties. Antimony can frequently be estimated in arylstibine oxides and triarylstibines which contain an amino group by direct titration with iodine in very dilute faintly acidic solution. If a group is not present which confers solubility in water, a suitable bicarbonate-alkaline solution can generally be obtained with the aid of tartaric acid and organic solvents. Alternatively about 1/1000 mol. of the substance is mixed with sodium chloride (0.2 gramme) and sodium bisulphate (3 grammes) in a Kjeldahl flask and boiled for 1 hour with a mixture of nitric acid (sp. gr. 1.491, 1.5 mils) and concentrated sulphuric acid (10 mils). After cooling, ammonium sulphate (1 gramme) is added and the solution is boiled for 30 minutes to expel nitric acid; it is subsequently diluted to about 300 mils and after addition of 5N-hydrochloric acid (20 mils) is reduced with sulphur dioxide and potassium bromide. The antimony is finally titrated with N/10 iodine in bicarbonate-alkaline solution.—Ann., through J. Soc. Chem. Ind., 39 (1920), 763A.

Benzyl Alcohol.—*Action on Proteids and on Diastase.*—J. Jacobson finds that benzyl alcohol even in dilutions of 1 in 1,000,000, precipitates albuminoids and that the precipitate does not redissolve in water. Benzyl alcohol also hinders the action of certain diastases.—J. pharm. chim., 21 (1920), 450.

Benzyl Alcohol.—*Preserving Solutions of.*—Macht and Shohl find that solutions of benzyl alcohol should be preserved in non-soluble glass containers, if deterioration is to be prevented.—J. Pharmacol. Exp. Therap., through J. Soc. Chem. Ind., 39 (1920), 801A.

Benzyl Alcohol.—*Therapeutics of.*—Voegtlin and Livingston find that injections of this substance into the thoracic region of the spinal cord are followed by a severe fall in blood pressure and decreased respiratory movements. Spinal anesthesia also results.—Am. J. Pharm., 92 (1920), 140. (J. K. T.)

Benzyl Compounds.—*Therapeutics of.*—D. I. Macht has reported the results of his investigations of some of the benzyl compounds. The alkaloids of the benzyl isoquinoline group are stated to lower the tone of non-striped muscle, which property is shared by benzyl benzoate and acetate. The latter is somewhat irritating when taken by the mouth. A wide margin exists between the therapeutic and toxic doses of benzyl benzoate. Saligenin (hydroxy-benzyl alcohol) acts as a local anesthetic, being about twice as effective as benzyl alcohol and about thirty times less toxic than novocain. Both saligenin and benzyl alcohol possess antiseptic properties, and in 0.5 per cent. solutions prevent the growth of streptococci. The latter drug has been found effective in excessive intestinal peristalsis, pylorospasm, and other conditions, including hiccough. When administered in cases of whooping-cough the results were very gratifying. It did not shorten the disease, but acted as a palliative, reducing the paroxysms both in number and violence. The dose varied from five to forty drops in water, three or four times a day, according to age and severity of the disease. The addition of 1 to 5 per cent. of benzaldehyde made the mixture more effective.—Chem. & Drug., 93 (1920), 1629.

Betanaphthol.—*Toxicity of.*—Kluge reports a case where a seven year old girl died from the effects of rubbing upon her skin a 15 per cent. betanaphthol salve. The child exhibited symptoms of acute nephritis.—Z. Med. Beamt., through Pharm. Ztg., 65 (1920), 601.

Betanaphthol.—*Treatment of Itch with.*—H. Sloboziano finds that if alcohol is used as the vehicle for applying betanaphthol as a parasiticidal agent, it enables the latter to come into close contact with its intended object. The solution penetrates into the folds of the skin, into the tracks of the sarcoptes, into the spaces and into the intercellular interstices of the epidermis. It dissolves the fats in the

capillary spaces, and is absorbed into those. The solution kills the parasite, and prevents further infection of all kinds. The alcohol should be 94 per cent. or more. For an adult the proportion of betanaphthol for use should be 7 to 10 per cent., according to the state of the skin; and this can always be diluted to 5 per cent. for patients with deep lesions, produced by scratching, in whom the stronger solution would cause pain. The itching usually disappears after the first application, because betanaphthol has an anesthetic effect, and this may be increased by the addition of 1 per cent. of menthol. The skin should be dry, and the lotion applied by means of a swab moistened in it; this is passed carefully over the whole surface of the skin without rubbing. The application is made twice daily for two or three days.—Gaz., Hopitaux, through Pharm. J., 105 (1920), 250.

Catechol.—B. Elsner reports that in dilutions not greater than 1 per cent., with excess of cold barium hydroxide solution, catechol gives a precipitate of a very sparingly soluble barium salt, $C_6H_4O_2Ba,3\frac{1}{2}H_2O$, in the form of silver-grey leaflets with a pearly lustre. Since resorcinol and quinol give no such precipitate, the reaction is suggested as a means of separation, which is probably superior to that of depending upon the use of benzene.—Monatsh., through J. Soc. Chem. Ind., 39 (1920), 291A.

Chloramines.—*Preparation and Uses.*—I. F. Harris discussing these compounds, points out that Dakin's solution is limited in its application because of its lack of stability, brief effect, difficulty of preparation and administration and uselessness in some infections. Chloramine—T, para-toluene-sodium sulphochloramide, is soluble in water, stable in solution, non-toxic and non-irritating and contains 12.6 per cent. of available chlorine. It can be used in strength greater or less than Dakin's and furthermore it can be used as a surgical paste for sterile or slightly infected wounds. Dichloramine—T, toluene-para-sulphon-dichloramine, contains 29.5 per cent. of available chlorine, is soluble in chloroform or chlorcosane and gives up its second atom of chlorine very readily. Chlorocosane is chlorinated paraffin specific gravity about 1.06, odorless, neutral and capable of dissolving from 8 to 10 per cent. of dichloramine—T. In itself it is about one third chlorine but has no antiseptic power because the chlorine is combined with the carbon. The application of dichloramine—T

chlorocosane prolongs therapeutic action because the chemical reaction is delayed.—J. Am. Pharm. Assoc., 9 (1920), 39. (Z. M. C.)

Cresol.—*Purification of.*—H. C. Hamilton states the cresol may be freed from its disagreeable odor, color and rendered completely soluble by the following process:

Dissolve the crude cresol in a molecularly equivalent solution of caustic soda, using sufficient water to dilute the sodium cresylate to a 25 per cent. solution. Then boil or pass live steam through the solution until free from odorous impurities, adding water as needed to avoid concentrating. Allow solution to cool, remove any separated naphthalene or neutral oils by skimming, filtration, or centrifuging. Then treat with sulphuric acid equivalent to the alkali used, allow the separated cresol to collect and carefully draw off free from water. Careful distillation will not separate cresols from accompanying colored compounds and higher boiling phenols, yielding a product consisting of the three isomeric cresols.—J. Ind. Eng. Chem., 12 (1920), 50. (L. A. B.)

Cresols.—*Disinfecting Values of the Three.*—F. Ditthorn finds that meta-cresol outstrips its two isomerides in germicidal power, which is not very marked with bacterial suspensions in salt solution and bouillon, but is considerable with liquids containing proteins. Of the two other isomerides, the ortho-compound possibly has a slightly greater action than the para-compound. In practice 2—2.5 per cent. solutions of the mixed isomerides are used and the differences observed are then of little importance.—Centralh. Bakt., through J. Soc. Chem. Ind., 39 (1920), 799A.

Cumarone Resin.—*Manufacture of.*—This new varnish basis is obtained from the "middle oil" of coal tar distillation. According to E. Glaser, this "middle oil" is allowed to stand for some time in order to let the naphthalin crystallize out. After this has been separated the mother liquor is distilled from wrought iron retorts of 1000 to 3000 liter content. First, crude benzol distils, followed at 170° to 200° by "creosote oil" which contains 10 per cent. of cumarone and 30 per cent. of phenol. The latter is separated by saponification, the hydrocarbon mixture is then treated with 5 per cent. sulphurc acid (60° B.), the acid is removed after which the hydrocarbon mixture is distilled when, at 200°, pure "solvent naphtha" passes over. The

residue after complete distillation of the "solvent naphtha" contributes the cumarone resin.—Chem. Umschau, through Pharm. Zent., 61 (1920), 252.

Coumarone Resins and Formolites.—M. Ragg states that coumarone resin should contain neither free nor combined sulphuric acid, as all sulphuric acid compounds rust iron. The resin is employed as varnish for lithographs, as well as in the manufacture of lacquers and paints; it also finds employment as a substitute for colophony in the manufacture of explosives. When used for sizing paper, it must be emulsified with animal glue or resin soap. The presence of added impurities is detected by the formation of a precipitate on the addition of sulphuric acid to the resin in benzol. Formolites (phenol-formaldehyde resins) may be divided into four classes: Insoluble in the usual solvents and infusible, *e. g.,* bakelites; soluble in certain solvents, but giving a lacquer which must be heated to be durable, *e. g.,* bakelite A and B, resinite; soluble in alcohol, and giving a usable varnish without heating, *e. g.,* issolin; soluble also in fatty oils and other solvents, *e. g.,* albertole. The necessary heating of the varnishes prepared from these condensation products somewhat limits their application; they can be employed as stove lacquers or for insulation, but their price prohibits their use on a large scale. Issolin is recommended as a substitute for spirit-soluble hard resin, shellac, or Manila copal, and in alcoholic solution is employed for insulating armatures, electro-magnets, and coils.—Farben. Ztg., through J. Soc. Chem. Ind., 39 (1920), 273A.

Diallylhomophthalimides.—*A New Class of Hypnotics.*—Lumiere and Perrin find that diethyl-, ethylpropyl-, dipropyl-, and diallylhomophthalimides may readily be prepared by the action of the corresponding alkyl iodides on homophthalimide in the presence of sodium ethoxide. They are all hypnotics, and at the same time only very slightly toxic and free from any unfavorable secondary action.—Compt. rend., through J. Soc. Chem. Ind., 39 (1920), 763A.

Guaiacol.—*Specific Gravity of.*—Jules Cofman-Nicoresti, reports that the specific gravity of guaiacol required by the B. P. greatly exceeds that found by every investigator for the pure substance. The

correct value for the purified compound is probably 1.143, but since much of the commercial article is prepared from cresol, traces of phenols would be difficult to remove and a slightly lower density may be allowed.—Pharm. J., 104 (1920), 26. (H. M.)

Guaiacol.—*Use as an Anesthetic.*—Dr. George Laurens advises the use of guaiacol as an anesthetic for the more ordinary operations on the ear, nose and throat. The method of preparation and administration is described. The action of guaiacol is slower than cocaine.—Med. Press, through Natl. Drug., 50 (1920), 191. (C. M. S.)

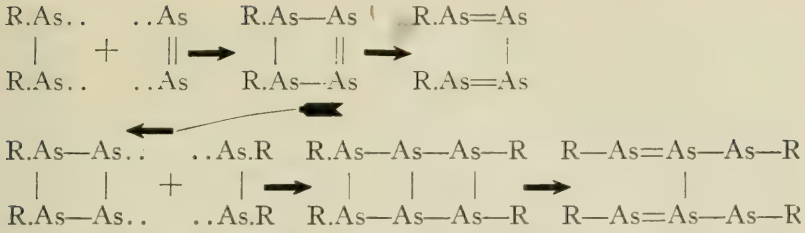
Guaiacol Iodide.—J. Maberly recommends the following combination as a convenient means of administering iodine in organic form:

Guaiacol, pure	1 minim
Solution of iodine (12½ grs. to oz.)	1 minim
Rectified spirit	20 minims
Distilled water	to make 60 minims

The ingredients are mixed in the order given, a slight rise of temperature occurring on the addition of the water. The free iodine disappears and a stable compound is formed in which the iodine, or a portion of it, replaces hydrogen in the guaiacol. One drachm of guaiacol-iodide solution prepared as above represents 0.026 grain (about 1/40 grain) of iodine. The dose of this solution is one drachm, mixed with an equal quantity of simple syrup and two drachms or more of water. Its use is recommended in all cases in which iodine is internally indicated, as glandular enlargements, etc. For children the dose is reduced in proportion to age.—Am. J. Pharm., 92 (1920), 48. (J. K. T.)

Guaiacol and Veratrol.—*Arsenic Compounds of.*—R. G. Fargher finds that the reaction between *p*-hydroxyphenylarsinic acid and potassium persulphate gives 3:4-dihydroxyphenylarsinic acid, though in small yield and much contaminated with the unchanged acid. Separation of the two was difficult, and their identity was most readily established by complete methylation and fractional crystallization of the product. 3-Amino-4-methoxy-phenylarsinic acid, prepared from

p-methoxyphenylarsinic acid by nitration and subsequent reduction, and 3-amino-4-hydroxyphenylarsinic acid were found to resemble *o*-aminoanisole and *o*-aminophenol in the difficulty which attended the decomposition of their diazo compounds, the energetic treatment necessary causing almost complete decomposition of the arsinic acids. The "Bucherer" reaction, by which the amino group in certain aromatic amines is converted into a sulphurous ester by the action of sodium hydrogen sulphite, and subsequently replaced by hydroxyl by suitable means, was also unsuccessful. The final method of attack —the Bart reaction, by which diazotized amines are coupled with sodium arsenite in alkaline solution with or without the presence of a catalyst, such as copper powder—proved successful, and 3-methoxy-4-hydroxyphenylarsinic acid, 3-hydroxy-4-methoxyphenylarsinic acid, and 3:4-dimethoxyphenylarsinic acid were prepared and their reactions studied, in particular the preparation of the corresponding nitro-derivatives and the reduction of these. 3-Methoxy-4-hydroxy-5-nitrophenylarsinic acid underwent the normal arsenobenzene reduction with sodium hyposulphite, giving rise to 3.3^1-dimethoxy-4:4^1-dihydroxy-5:5^{1}diaminoarsenobenzene, differing from "salvarsan" only by the presence of a methoxyl-group, and resembling it closely in its properties and toxicity. 3-Hydroxy-4-methoxy-5-nitrophenylarsinic acid under similar conditions behaved abnormally, yielding a polyarsenide of the type R_2As_4; whilst 3:4-dimethoxy-5-nitrophenylarsinic acid, which did not yield an insoluble reduction product, probably on account of sulphamic acid formation, on conversion into the amino-acid, and subsequent reduction with hyposulphite gave an abnormal compound of a second type—R_2As_3, or R_4As_6. The mechanism of the formation of these abnormal products and their possible formulation were discussed. It had been stated by Bertheim that a mixture of molecular proportions of two arsinic acids yielded solely the unsymmetrical arsenobenzene. More recently Karrer had questioned the mechanism assumed by Bertheim, and suggested that the symmetrical arsenobenzenes were first formed and then underwent "double decomposition." Utilizing the principle involved in the second suggestion, as this seemed to be in harmony with the observed facts, fission of the arsenic utilized to form the polyarsenides apparently succeeding rather than preceding reduction, formulæ were evolved for the types R_2As_4 and R_4As_6 in accordance with the scheme:



The difficulty of completely proving homogeneity in these compounds was pointed out.—Pharm. J., 104 (1920), 580.

Hydroquinone.—*Reducing Reactons of.*—J. Messner points out that most chemical books make an error in stating the reaction of hydroquinone with silver salts and with Fehling's solution. The truth is that hydroquinone reduces silver nitrate solution at ordinary temperatures, whereas with Fehling's solution it merely produces a green color in the cold; reduction to cuprous oxide requiring the use of heat or many hours of standing at ordinary temperatures.—Pharm. Zent., 61 (1920), 454.

Mustard Gas.—*Decomposition of.*—Felsing and his co-workers state that mustard gas, irrespective of the process by which it is manufactured, undergoes some decomposition in steel shells at 60°, sulphur being deposited. After a lapse of about 9 days, a maximum pressure of 2 atmospheres developed within the shell. A considerable increase in acidity also was noted, this however not being sufficient to corrode the metal seriously. It was found that preliminary treatment of the mustard gas with gaseous ammonia, retarded the development of pressure to a sufficient degree to justify its employment in all cases where mustard gas was to be kept in steel shells or containers for some time.—J. Ind. Eng. Chem., 12 (1920), 1063. (G. C. D.)

Paraoxyphenylurea.—*Sweetening Power of.*—Boedicker and Rosenbusch in experiments conducted in the scientific department of J. D. Riedel show that *p*-phenetolurea is the only product of its type which possesses a sweet taste to any marked degree.—Ber. dtsch. Pharm. Ges., 30 (1920), 251. (H. H. S.)

Paraphenylenediamine.—*Assay of.*—Callan and Henderson assays preparations containing this compound, as follows: To the

liquid under examination an excess of standardized sodium hypochlorite solution is added and, after allowing the mixture to stand for a short time, the excess of hydrochlorite is titrated back with standardized sodium arsenite solution, using potassium iodide-starch paper as indicator. The calculation is based on the para-phenylenediamine being quantitatively converted into insoluble benzoquinone dichloroimide. Naphthalenediamine and para-amidodiphenylamine can be estimated by this method also, but it cannot be applied to substances containing a sulphuric acid group, because in such cases soluble chloroimides are formed.—J. Soc. Chem. Ind., through Drug Circ., 64 (1920), 217.

Phenetol Carbamide.—*Taste of Derivatives of.*—Thoms and Nettesheim describe the preparation of the following derivatives of paraphenotol carbamide: 3-nitro-p-phenetolcarbamide; 2-nitro-p-phenetolcarbamide; sym. dinitro-p-diphenetolcarbamide; 3-nitroso-p-phenetolcarbamide; 3-amido-p-phenetolcarbamide as well as its hydrochloride and sulphate; 3-acetamido-p-phenetolcarbamide; azimido-p-phenetolcarbamide; 2-amido-p-phenetolcarbamide and hydrochloride; 2-acetamido-p-phenetolcarbamide; 2-sulpho-p-phenetolcarbamide as well as the sodium and lead salts; 2-chlor-p-phenetolcarbamide; 2-brom-p-phenetolcarbamide, and dichlor-p-phenetolcarbamide. None of the products, however, possessed a sweet taste. The claim that substitutions in the ring of p-phenetolcarbamide means loss of the sweet taste of the product is therefore upheld.—Ber. dtsch Pharm. Ges., 30 (1920), 227. (H. H. S.)

Phenol.—*Colorimetric Assay in the Presence of Other Phenols* —R. M. Chapin describes a colorimetric assay which he finds fairly accurate, based upon the red color produced under certain conditions by Millon's Reagent with phenol and not with other phenols. By this method 0.04 milligramme of phenol can be determined in 4 mils of fluid containing also 4 milligrammes of cresol or other phenols. In the paper are given details of manipulation, including modifications required when certain phenols are present.—J. Ind. Eng. Chem., 12 (1920), 771.

Phenol.—*Manufacture of.*—The manufacture of phenol from chlorobenzene by heating under pressure with sodium hydroxide so-

lution in a continuous high pressure autoclave, is described by Kirk Brown.

The reacting fluids are forced through a coil of extra heavy hydraulic pipe, under a pressure of 2,500 to 3,000 lbs. per sq. in., maintained at a temperature of 700° F. by a bath of nitrite of soda. The sodium phenylate thus formed is permitted to pass from the coil by a needle valve, which is regulated to maintain the proper pressure in the coil.

After condensing, the sodium phenylate is acidified with hydrochloric acid and the resulting crude phenol distilled.—J. Ind. Eng. Chem., 12 (1920), 279. (L. A. B.)

Phenol.—*Treatment of Influenza with.*—C. B. Richardson offers the following suggestions for treatment which he thinks will be found eminently successful. His usual routine, when called to see an adult with a temperature, headache, pains, etc., is to give phenacetin, 3 to 5 grains, every four hours for a day or two, which generally relieves. Then a phenol mixture is given every four hours if cough and lung symptoms predominate; for milder and suspicious cases, three times a day will suffice, but it must be continued while the cough lasts. For convenience in prescribing and dispensing he advocates the Glycerinum Acidi Carbolici, B.P., so that the prescription reads:

Glycerinum Acidi Carbolici	*m* lxxx.
(2 *m* phenol pro dosa.)	
Glycerini	ʒ iii.
Syr. Papaveris	ʒ iii.
Aq.	ad ʒ viii.

Cap. ʒ i. iv. horis, vel ter quotidie.

No unfavorable symptoms have been observed under this treatment, and patients do not mind the taste, which is to some extent covered by the Syr. Papaveris, especially as it rapidly relieves their cough, cleans the tongue, and certainly tends to abort lung complications, if the case is seen early.—Practitioner, through Pharm. J., 105 (1920), 220.

Phenolphthalein.—*Assay of.*—According to S. Palkin phenolphthalein, when treated with iodine, under certain conditions, gives a quantitative yield of tetraiodo-phenolphthalein. Not more than 0.25 gramme of phenolphthalein is dissolved in a minimum quantity of an

aqueous solution of potassium hydroxide, 30 per cent. strong. Ice, in quantity of 20 grammes is added, followed by about 10 mils of iodine reagent (an excess). The reagent is prepared by dissolving a sufficient quantity of iodine in a 15 per cent. solution of potassium iodide to equal 10 per cent. of the former substance in solution. The color is then discharged by addition of an alkali. The mixture is then treated with hydrochloric acid, added drop by drop, until precipitation is complete. In the event that the supernatant liquid is not brown in color, more of the iodine reagent must be added. The precipitate is then dissolved in solution of potassium hydroxide, 30 per cent. strong, and re-precipitated with hydrochloric acid. This operation of solution and re-precipitation is repeated three or four times. The final alkaline solution is treated with 0.50 mil of 15 per cent. sodium sulphite solution, a few mils of hydrochloric acid are added and the mixture extracted several times with a 1:3 acetone-chloroform solution. The combined extracts are evaporated and the residue of pure tetra-iodo-phenolphthalein thus obtained dried at 100° for about 20 minutes, and then weighed. The weight thus obtained multiplied by the factor 0.3781, gives the amount of phenolphthalein. In case the phenolphthalein is in tablet form together with chocolate, the tablets are reduced to powder and extracted for 2 hours with petroleum ether for two hours in order to remove fat. The residue is then extracted with acetone, the acetone solution evaporated, the residue next dissolved on solution of potassium hydroxide, and the process continued as above.—J. Ind. Eng. Chem., 12 (1920), 766. (G. C. D.)

Phenyl Carbinols.—*Mercury Compounds of.*—Hart and Hirschfelder call attention to the fact that in spite of the large number of organic mercury compounds which have hitherto been prepared they have been unable to find references to any compounds of mercury and arsenic with phenyl carbinols.

In view of the relatively low toxicity of phenyl carbinols, the presence of carbinol groups in many of the most active natural alkaloids and the interesting local anesthetic and anti-spasmodic properties possessed by phenyl carbinols and their esters, it seemed to them that mercury compounds of this group might prove useful as antiseptics and perhaps also possess valuable chemotherapeutic properties. They have developed a new method for synthesizing

p-hydroxy-*m*. nitrophenyl carbinol and nitro-saligenin by the action of bromomethyl alcohol on *o*- and *p*-nitrophenol, respectively. This synthesis may prove useful for other carbinols. The zinc thiocyanate method of Jamieson (See YEAR BOOK, 1919, 354) has been found satisfactory for determining the mercury in these aromatic compounds, which have been found useful antiseptics.—J. Am. Chem. Soc., 42 (1920), 2678. (J. L. M.)

Phthaleins.—*Mercury Derivatives of.*—During the past 3 years Edwin C. White and his collaborators have been engaged on studies of organic mercury compounds particularly with reference to their use both internally and locally, in the treatment of genito-urinary infections and of syphilis. The results obtained in the laboratory and the clinic with some of these compounds have been of sufficient value to warrant a description of the preparation and properties of these substances, particularly because little of a chemical nature has heretofore appeared in regard to mercurated phthaleins and because the methods used by the writer differ from the method described in the meager literature available. This literature consists solely of 2 German patents.

White describes two processes of mercuration which are applicable to phthaleins. The substitution of mercury is analogous to sulfonation, halogenation or nitration, and the metal enters the phenolic group of the phthalein molecule in the ortho position to the hydroxyl or the quinone oxygen. The number of atoms of mercury entering the molecule is limited by the number of such free ortho positions, and if all four are occupied no substitution of mercury takes place. Mercury derivatives containing from one to four atoms of the metal have been prepared from the following phthaleins: phenolphthalein, o-cresol-phthalein, fluorescin, dibromo-fluorescein and phenosulphonphthalein. The methods of substitution differ from those used in the earlier literature on mercurated phthaleins.

It is pointed out that chemical composition alone does not fix the identity of biological behavior or therapeutic effect of compound of this class, and that samples cannot be considered identical unless they are made in precisely the same way and have the same composition.—J. Am. Chem. Soc., 42 (1920), 2355. (J. L. M.)

Pyramidon.—*Analytical Characters of.*—J. A. Sanchez gives analytic methods including the colorimetric determination of pyra-

midon by iodic acid; detection of pyramidon in presence of large quantities of antipyrine by silver nitrate; gravimetric separation of antipyrine and pyramidon with formaldehyde; detection of a small quantity of antipyrine in pyramidon by means of nitrous fumes; and the alkalimetric determination of pyramidon.—Ann. Soc. Quim. Argentina, through J. Soc. Chem. Ind., 39 (1920), 500A.

Pyramidon.—*Detection of Antipyrine in.*—A. Escaich proceeds as follows: Dissolve 1 gramme of the suspected substance in 10 or 20 mils of water. Treat this solution with 1 or 2 drops of an alkali nitrite solution (5 per cent.) and five drops of sulphuric acid. After the transient blue color which first appears has faded, from 0.05 to 0.10 gramme of lead peroxide is added, when, if antipyrine was present, a violet color, rapidly changing to a permanent cherry-red is noted. The author also describes the following modification of the quinone-imide test for phenol, or for aniline and derivatives, after diazotizing and boiling, thus converting it into phenol. The test is claimed to be very sensitive. Ten to fifteen mils of the solution to be tested are treated with 5 to 10 drops of ammonia water, 0.05 to 0.10 of sodium persulphate and 4 to 5 drops of tenth normal silver nitrate solution. A bright green color at once makes its appearance and becomes much intensified. For solutions containing phenol in excess of 0.05 gramme per liter, the color finally changes to blue. For lesser concentration the final color change is to yellow. Alpha-naphthol in hydro-alcoholic solution with sodium nitrite and a few drops of an acid solution of mercuric sulphate, takes on a bright red coloration, a precipitate resembling mercuric iodide in appearance finally appears. Betanaphthol under like conditions yields a yellow precipitate.—J. pharm. chim., 22 (1920), 140. (G. C. D.)

Pyrocatechol-Arsenic Acids.—From a mixture of concentrated aqueous solutions of pyrocatechol and arsenic acid, star-like crystals of pyrocatechol-arsenic acid, possessing the formula $AsO(OC_6H_4O)_3H_3+4\ H_2O$ separate on standing. The acid forms with inorganic and organic bases well crystallized primary salts, according to R. Weinland and J. Heinzler. The salts with alkaloids are very difficultly soluble and the acid can, therefore, be used as an alkaloidal reagent. The acid is soluble in most of the organic solvents, with the exception of hydrocarbons, and crystallized from these solvents

with varying quantities of water of crystallization. Phosphoric acid acts similar to arsenic acid. Compounds of pyrocatechol with other metallic acids such as molybdic and stannic acid and also with boric acid, have been known for some time.—Chem. Zeit., through Pharm. Weekbl., 57 (1920), 181. (H. E.)

Resorcinol.—*Production by Fusion.*—Phillips and Gibbs by the use of a specially constructed apparatus studied the alkali fusion of sodium benzene metadisulphonate with sodium hydroxide with the formation of resorcinol, considering temperature, time, ratio of the hydroxide to the disulphonate and concentration of water in the fusion mixture. The results indicate that 310° is the best temperature; 2 hours is the best fusion time; 16 moles of sodium hydroxide to 1 mole of sodium benzene metadisulphonate is the best ratio; and further that the presence of water tends to lessen the yield of resorcinol.—J. Ind. Eng. Chem., 12 (1920), 857.

Resorcinol.—*Use in Influenza.*—J. Tornai reports gratifying results in treating influenza by use of intravenous injections of resorcin. The injected fluid was prepared as follows: Resorcin, highest purity, 3.0 grammes; sodium chloride, chemically pure, 9.0 grammes; sterilized distilled water, 100 grammes; filter and dispense as perfectly clear solution.—Berl. klin. Wsch., through Pharm. Zent., 61 (1920), 503.

Thymolphthalein.—*Use as an Indicator.*—Hold recommends thymolphthalein as indicator in acidimetry. The indicator, which is as sensitive as phenophthalein, is colorless in neutral or acid solutions; blue in akaline liquids.—Pharm. Zent., through Drug. Circ., 64 (1920), 64.

Vanillin.—*Distinction from Heliotropin.*—A. Labat reports that when 2 mils of suphuric acid is mixed with 0.1 mil of an alcoholic solution of vanillin and 0.1 mil of an alcoholic 5 per cent. solution of gallic acid and when the mixture is heated on a water bath, a yellow color is produced. With heliotropin under the same conditions an emerald-green or blue color is produced.—Bull. Soc. Pharm. Bordeaux, through Pharm. Weekbl., 57 (1920), 592. (H. E.)

Vanillin.—*Volatility in Mixtures.*—Sprinkmayer and Gruener studied the question of the volatility of vanillin, coumarin and heliotropin in mixtures with solid diluents. They find that heliotropin is the most volatile but that vanillin and coumarin are also quite volatile; a mixture of these two perfumes with potato starch losing 81 per cent. of its strength within three months. Mixtures of these perfumes with sugar are a trifle more stable than those with potato starch.—Z. Unters. Nahr. Genussm., through Pharm. Zent., 61 (1920), 136.

FATS AND OILS.

Fats and Oils.—*Iodine Number Determination.*—W. Devrient describes the methods and comparisons of results of determining the iodine number of fats and oils. The experiments were performed mostly with elaidic acid. He concluded that the method of Hanus is the best. This procedure is as follows: 0.6 to 0.7 gramme of solid fat, 0.2 to 0.25 gramme of oils which have an iodine number less than 120 and 0.1 to 0.15 gramme of oils having iodine number greater than 120 are dissolved in 10 mils of chloroform in a glass stoppered flask. To this is added 25 mils of a bromiodide solution (10 grammes of bromiodide and 500 mils of glacial acetic acid) of known titer and allowed to stand for 15 minutes with occasional shaking. When the reaction is complete add 15 mils of 10 per cent. potassium iodide solution and titrate the excess iodine with thiosulphate solution.—Ber. dtsch. Pharm. Ges., 30 (1920), 361. (H. H. S.)

W. Olzewski gives a summary of the various methods of determining the iodine number of fats, a bibliography of 16 items being included in the paper.—Pharm. Zent., 61 (1920), 641.

In estimating the iodine value of fats, Rupp recommends replacing Hanus' iodo-bromide solution by a solution prepared by adding to 13 grammes of finely powdered iodine a small amount of glacial acetic acid, followed by 8 grammes of bromine and finally sufficient glacial acetic acid to obtain 1000 mils. The liquid is to be shaken until the iodine is dissolved. For estimating the iodine value, 0.5 to 0.6 gramme of solid hard fats, 0.3 to 0.35 gramme of soft hard fats, 0.20 to 0.25 gramme of olive oil, 0.13 to 0.15 gramme of almond, sesame, peanut and similar oils, and 0.09 to 0.11 gramme of cod liver oil, linseed oil, etc., is dissolved in 15 mils of chloroform, 25 mils of

the iodo-bromide solution is added, the mixture is allowed to stand for 15 minutes (30 minutes in the case of cod liver oil and linseed oil) protected from light and is rotated frequently during this time. After the addition of 1.5 grammes of potassium iodide and 50 mils of water, the liberated iodine is titrated with N/10 sodium thiosulphate solution and starch as indicator. The iodo-bromide solution is standardized by titrating a mixture of 25 mils of the solution and 15 mils of chloroform in the manner just given.—Apoth. Ztg., through Drug. Circ., 64 (1920), 179.

Sundberg and Lundborg have made a critical study of the Hübl, the Winkler, the Wÿs and the Hanus methods of the determination of the iodine number of oils and fats. Of these, they find the Hanus method most satisfactory. The article gives some slight modifications of the Hanus method as suggested by the authors.—Z. unters. Nahr. Genussm., through Pharm. Ztg., 65 (1920), 443.

Fats and Oils.—*Microchemical Tests.*—Rosenthaler offers the following: To two milligrammes of the oil, on a slide, add a drop of saturated alcoholic potassium or sodium hydroxide solution. Crystallization takes place at once with arachis and olive oils; rape, castor and poppy oils yield characteristic forms. Cod liver oil is unique in giving no crystals with potassium hydroxide solution but yields crystals with sodium hydroxide solution. The effects of potassium hydroxide and sodium hydroxide are generally different. With potassium hydroxide solution, the seeds of peanuts, almonds, peach, cacao, and ricinus show the same effect as their respective oils. This is true of ricinus seeds and sodium hydroxide solution also. Sketches of the crystals are shown.—Schweiz. Apoth. Ztg., 58 (1920), 545-552. (H. A. L.)

Fats and Oils.—*Purification of.*—A number of oils and fats, such as tallow, distilled olein, etc., can be purified by nascent hydrogen (zinc and acid), according to Lach. For removing rancidity from fats he recommends boiling the fats with live steam and treating them during the heating process with 1 to 2 per cent. of alum, added in a concentrated solution in small portions. After allowing the mixture to stand for one hour, the fat is neutralized and separated in the usual way. This method can be applied for rendering rancid bone fat, margarin, etc., fit for use.—Oel u. Fettind., through Drug Circ., 64 (1920), 298.

Fats.—*Removing Rancidity from.*—When rancid fats are shaken repeatedly with alcohol the latter takes up the fatty acids and oxy-fatty acids and also other compounds which cause the rancidity, such as lactones, esters, etc., according to Oettinger. Any alcohol suspended in the fat can easily be expelled by heating. The characteristic tallow-odor of fats which is obtained from the bones with steam can be destroyed by heating the fat with onions or apple peelings, according to the use to be made of the fat.—Z. angew. Chem., through Drug. Circ., 64 (1920), 64.

Fat.—*Two Kinds of Animal.*—It has been recognized for some time that there are two kinds of animal fat. One is the familiar subcutaneous form. The other occurs as small discrete droplets in cells grouped together in well-defined masses. Investigation by W. Cramer has shown that this glandular fat differs in its physiological functions from adipose tissue. In most mammals the glandular fat arranged around a central nucleus is apparent in the embryo, but loses its distinctive appearance in the adult, so that it can rarely be detected microscopically. In the rat and the mouse, however, the embryonic form persists throughout life. Glandular fat differs from ordinary fat in that its cells are rich in lipoids and contain a relatively large amount of protoplasm. When food is withheld from a rat or mouse, the ordinary fat greatly diminishes, but the glandular fat shows no obvious decrease. Also, when the animals are obese, there is no evident increase in the amount of glandular fat. When the animals are fed on a diet free from vitamines, they become extremely emaciated, and the glandular fat loses its lipoid contents. It still remains as a tissue; its cells are large, rich in protoplasm and mitochondria, and is surrounded by capillary blood-vessels; in fact, it assumes all the characters of an organ of internal secretion. It is suggested that glandular fat is functionally related to the thyroid and adrenals, and that it contains a reserve supply of vitamine which can be drawn upon when that substance is deficient in the diet. The name lipoid or cholesterin gland is suggested for this tissue.—Brit. J. Exp. Path., through Pharm. J., 105 (1920), 323.

Oils.—*Detecting Minute Amounts of Petroleum Ether in.*—A number of methods for the detection of petroleum ether in vegetable oils have been proposed. A careful study of these by M. Aida has

shown that they are not satisfactory, but it has been found that Nastjukoff's formolite reaction may be applied successfully for the purpose as follows:

The oil (50—100 grammes) is saponified by means of potassium hydroxide solution. Distilled water and pure calcium chloride solution are added, the liquid distilled by means of steam, and the distillate treated with 40 per cent. formaldehyde solution and a few drops of concentrated sulphuric acid. A reddish-brown film coloration on the surface of the liquid, gradually changing to deep yellow, indicates presence of petroleum ether. If a few drops of the distillate are added to water, a brilliant interference ring of optical waves is produced on the surface of the water; this ring becomes almost invisible after standing for some time and disappears completely on heating. With soya bean oil the ring does not change, even on heating. The above process is capable of detecting traces of petroleum ether in vegetable oils, and may be made the basis of a quantitative method, the formolite precipitate being weighed after drying at 110° to 115° —J. Soc. Chem. Ind., 39 (1920), 152T.

Arachis Oil.—*The Fatty Acids of.*—Heiduschka and Felser report that the composition of the mixed fatty acids obtained from a sample of arachis oil (iodine value 86.1) was: Arachidic acid, 2.3; lignoceric acid, 1.9; stearic acid, 4.5; palmitic acid, 4.0; oleic acid, 79.9; linolic acid, 7.4 per cent. The oleic acid may have included a small quantity of hypogæic acid.—Z. Unters. Nahr. Genussm., through J. Soc. Chem. Ind., 39 (1920), 272A.

Argand Oil.—*Can it be Counted Upon Commercially?*—E. Fleury asks this question and forthwith answers in the negative, in an interesting description of the tree, its fruit, its use as fodder for ruminants, its seed and its hard shell, and its kernel having an oil content of 50 per cent. While the latter point has been emphasized, Fleury points out that the oil content in terms of the whole fruit (which would have to be harvested) is but 1 per cent. and further shows that the labor of removing the useless pulp and epicarp would make the purified oil more costly than olive oil.—J. pharm. chim., 22 (1920), 165.

Beech Nut.—*Production of Oil from.*—In certain parts of France, the beech nut is an important source of oil; the forest of

Retz, near Soissons, producing as much as 80,000 kilos per annum. The beech nut contains 16.25 per cent. of water, 17.25 per cent. of crude protein, 24.16 per cent. of fat, 19.47 per cent. of non-nitrogenous extractive, 19.15 per cent. of cellulose, and 3.72 per cent. of ash. The commercial yield of oil is about 16 to 17 per cent.—La Nature, through J. pharm. chim., 22 (1920), 285.

Cacao Butter.—*Digestibility of.*—Gardner and Fox find that oil of theobroma is rather less digestible than butter, and beyond slight laxative action no undesirable physiological effects were observed to follow the administration of considerable quantities of the fat.—Biochem. J., through J. Soc. Chem. Ind., 39 (1920), 277A.

Cacao Butter.—*Substitute.*—For making suppositories as a substitute for oil of theobroma, a mixture of one part of spermaceti and three parts of olive oil has been suggested. This mixture, which melts at 37.2° C., is said to give quite satisfactory results in making suppositories by the warm process, but cannot be used for making them by pressure by the cold method.—Pharm. Post., through Drug. Circ. 64 (1920), 22.

Cantaloup Seed Oil.—*Composition of.*—Baughman, Brauns, and Jamieson call attention to the fact that a large sample of cantaloup seed received from the Imperial Valley, California, showed by their extraction 30.4 per cent. of oil. The chemical and physical characteristics of the oil were determined. A study was also made of the chemical composition, the results of which are given in the following table:

Glycerides of	Myristic acid	0.3
	Palmitic acid	10.2
	Stearic acid	4.5
	Oleic acid	27.2
	Linolic acid	56.6
Unsaponifiable matter		1.1
		99.9

—J. Am. Chem. Soc., 42 (1920), 2398. (J. L. M.)

Castor Oil.—*A la Araby*—Arabians mask the taste of castor oil by adding 15 to 20 grammes to a glass of milk. This is heated

and stirred. Shortly a perfect emulsion is formed and to this a generous quantity of syrup of orange flowers is added. This is said to increase the activity of the oil.—Journal de Medicin, through Bull. Pharm., 34 (1920), 479. (C. M. S.)

Castor Oil.—*A New Oxystearic Acid from Hydrogenated.*—Thoms and Deckert have isolated from hydrogenated castor oil 1.12 oxystearic acid $CH_3\ (CH_2)_5\ CHOH\ (CH_2)_{10}\ COOH$, thus probably confirming the Goldsobel (1894) formula for ricinoleic acid, $CH_3\ (CH_2)_5\ CHOH\ CH_2\ CH{=}CH\ (CH_2)_7\ COOH$.—Pharm. Ztg., 65 (1920), 753.

Castor Oil.—*Production of.*—A monograph on castor oil by J. H. Shrader has been issued by the U. S. Department of Agriculture (Bulletin 867. Professional paper, Sept. 3, 1920).

The bulletin contains such valuable information as: the normal annual consumption of the oil in the United States; the average import of seeds during the war and the present situation of the American crop.

The paper abounds in interest and information concerning the manufacture and uses of the oil.—J. Soc. Chem. Ind., 39 (1920), 392R. (F. H.)

Chaulmoogra Oil.—*Fractionation of.*—Dean and Wrenshall call attention to the fact that the substance known commercially as claulmoogra oil has assumed considerable importance in recent years. New interest is now aroused by the results obtained by intramuscular injections of this oil fluxed with olive oil, a line of experimentation to which the work of Heiser was especially stimulating. Leprologists believe that although chaulmoogra oil has by no means been proven a specific in leprosy, it was the most promising drug known in combating the disease.

The statements in the older literature dealing with the origin and composition of chaulmoogra oil are conflicting and unreliable, but the true origin and nature of the oil was elucidated by Power and his collaborators in a series of papers from the Wellcome Chemical Research Laboratories. (See Year Book, 1915, 299), who showed that the true chaulmoogra oil is derived from the seeds of *Taraktogenes Kurzii* and that the oils from two allied species of *Hydno-*

carpus were practically identical. The oil from *Gynocardia odorata*, however, is wholly different. The outstanding feature of their work was the discovery of a new type of fatty acid present in taraktogenos and hydnocarpus oil.

After several years' experience with ethyl esters of the fatty acids of chaulmoogra oil, Dean and Wrenshall feel justified in stating that the fatty acids of chaulmoogric acid series are specific in leprosy. It seemed important to test out the hypothesis stated above by placing groups of lepers on treatment with the pure ethyl esters of chaulmoogra acid and hydnocarpic acid. This necessitated the preparation of considerable quantities of the pure acids and led to the study of the method of fractionating chaulmoogra oil which should be consulted by those interested.—J. Am. Chem. Soc., 42 (1920), 2626. (J. L. M.)

Chaulmoogra Oil.—*Therapeutics of.*—This oil is obtained by expression from the seeds of an East Indian tree, *Taraktogenos kurzii.* Closely related oils are obtained from *Hydnocarpus wightiana* and *H. anthelmintica.* This class differs from other known oils in being composed chiefly of the glycerol esters of two unsaturated fatty acids, named chaulmoogric acid and hydnocarpic acid. In India, chaulmoogra oil has been used both orally and externally in the treatment of leprosy since prehistoric times. Tourtoules used the oil subcutaneously in 1899. V. D. Heiser used the oil in 1914 for the treatment of leprosy by intramuscular injection. Leonard Rogers used orally a mixture of the fatty acids from the oil, which he called gynocardic acid, and later used the sodium salts of these acids subcutaneously (1916), and later on intravenously. Hollman and Dean employed the ethyl esters of the fatty acids from the oil in 1919.—J. Amer. Med. Assoc., 75 (1920), 1361. (W. A. P.)

Chaulmoogra Oil.—*Use in Leprosy.*—Continued trials directed by J. T. McDonald at the leprosy investigation station of the U. S. Public Health Service and the Kalihi Hospital at Hawaii seem to justify more than ever the statement that chaulmoogra oil contains one or more agents that exert a marked therapeutic action in many cases of leprosy. The intramuscular injection of the soluble ethyl esters of the fatty acids from chaulmoogra oil usually leads to a rapid improvement in the clinical symptoms of leprosy. The ethyl esters

of iodine, addition compounds of the unsaturated fatty acids in chaulmoogra oil, have also been used. There is no experimental proof that this addition of iodine causes any increase in the effectiveness of the material used.—J. Amer. Med. Assoc., 75 (1920), 1071. (W. A. P.)

McDonald and Dean further report:

"1. The intramuscular injection of the ethyl esters of the fatty acids of chaulmoogra oil usually leads to a rapid improvement in the clinical symptoms of leprosy. In many cases the lesions disappear, except for scars and permanent injuries, and the leprosy bacillus can no longer be demonstrated.

"2. When combined with iodine, the fatty acids of chaulmoogra oil and their esters give good results; but there is no adequate experimental proof that this addition of iodine causes any increase in the effectiveness of the materials used.

"3. All of the available evidence obtained from the use of fractions of the fatty acids of chaulmoogra oil indicates that the therapeutic action is due to one or more of the fatty acids of the oil or to some as yet unidentified substance associated therewith. The various methods of fractionation heretofore employed have failed to demonstrate the active agent.

"4. Although conclusive evidence is not at hand, it is probable that the oral administration of chaulmoogra oil derivatives is of minor importance compared with the injections.

"5. In treating leprosy, it is important to make use of all auxiliary agencies to build up and maintain bodily vigor.

"6. Hypodermic injections of the ethyl esters into leprous nodules are followed by marked swelling with ultimate recession of the lesions. This is a valuable auxiliary treatment for especially resistant lesions."—Pub. Health Rept., through Drug. Circ., 64 (1920), 426.

Chaulmoogra Oil.—*Use in Tuberculosis.*—This oil and preparations made from it are at present extensively employed and seem to produce amelioration in the majority of lepers to whom it has been administered persistently. Investigation has shown that chaulmoogra oil contains bactericidal substances that are one hundred times more active than phenol, and that this bactericidal action is specific for the acid fast group of bacteria to which causative organ-

ism of leprosy belongs. The product is inactive against all other organisms studied. On the other hand, it has been shown that sodium morrhuate and the fatty acids of cod liver oil do not have a similar action in tuberculosis which is also due to an acid fast bacterium. The value of chaulmoogra preparations in tuberculosis remains to be demonstrated, and their clinical trial should await their experimental investigation. The indiscriminate use of drugs in tuberculosis may arouse false hopes and may not be without danger to the patient.—J. Am. Med. Assoc., 74 (1920), 1578. (W. A. P.)

Chia Oil.—Gardner and Holdt have examined the seeds (from *Salvia hispanica*) from Mexico and found: Oil obtained by pressing, 22.33 per cent.; oil in press cake, 10.5 per cent.; nitrogen in cake, 3.6 per cent.; P_2O_5 in cake, 1.5 per cent. The filtered oil gave the following data: Sp. gr. at 15.5°, 0.9338; acid value, 0.6; iodine value, 192.2; saponification value, 192.2; unsaponifiable matter, 0.8 per cent.; $n_D^{25}=1.4855$. The oil was clear and of light amber color. It dried slowly in its raw state and the surface in a film tended to pull together at points, indicating high surface tension. When siccatized, the oil dried as rapidly as linseed oil. The "crawling" tendency of the oil film is practically overcome by heating to 260° for 15 minutes, this treatment yielding an oil which when siccatized with a liquid drier, showed even superior power to linseed oil treated with the same amount of drier. The wetting power of the oil as measured by the method for determining the oil absorption of pigments was lower than that of linseed oil, 6.2 mils of chia oil as against 5.1 mils of linseed oil being absorbed by 20 grammes of white lead. The maintenance of its color during heat treatment indicates the suitability of chia oil for the manufacture of pale varnishes. It seems probable that several species of *Salvia* contain oils exhibiting varying degrees of drying power.—Circ. Paint Mnftrs. Assoc., through J. Soc. Chem. Ind., 39 (1920), 789A.

Cholesterin—*Occurrence in an Ovarian Cyst.*—R. Arnold reports upon the examination of an ovarian cyst which instead of containing a gelatinous fluid, was entirely solid. Analysis of the material showed it to be cholesterin.—J. pharm. chim., 21 (1920), 305.

Chrysalis Fat.—The cocoons of the silkworms after the silk had been taken off were formerly sold as food for pigs and chickens.

Lately the fat is extracted with benzin or carbon tetrachloride. If benzin is used, the yield is about 35 per cent., when carbon tetrachloride is used about 42 per cent.

The fat is partly solid and partly liquid and is used in the manufacture of soap.—Pharm. Zent., 61 (1920), 383. (O. M.)

Oil of Cnicus Benedictus.—A Ferencz finds that the oil of *Cnicus Benedictus* seeds is odorless and tasteless, that pressed cold being pale yellow and that pressed hot dark brown; both oils exhibit semi-drying properties. The physical and chemical characters are as follows: Sp. gr. at 15° C., 0.9262; acid value, 1.2; refractive index, 1.47178; saponification value, 191; iodine value, 141; Hehner value, 95.75; Reichert-Meissl value, 2.53; Polenske value, 0.60; unsaponifiable matter, 0.66; iodine value of unsaturated fatty acids, 146. The unsaturated fatty acids consist of about 74 per cent. of oleic and 26 per cent. of linolic acids, and the saturated fatty acids of about 40 per cent. of stearic and 60 per cent. of palmitic acids. According to Pater the seeds contain 24.4—28.3 per cent. of fatty oil, 14.83 per cent. being obtainable by pressing in the cold.—Arch. Pharm., through J. Soc. Chem. Ind., 39 (1920), 71A.

Coconut Oil.—*Constituents of.*—Boemer and Baumann find that coconut oil contains the glycerides of caprylolauromyristin (m. p. 15°), myristodilaurin (m. p. 33°), laurodimyristin (m. p. 38.1°), palmitodimyristin (m. p. 45.1°) and sterodipalmitin (m. p. 55°) as well as olein. The glycerides of capronic and capric acid were not found.—Z. Unters. Nahr. Genussm., through Pharm. Zent., 61 (1920), 727.

Coconut Oil.—*Rancidity of Philippine.*—Thirty samples of edible coconut oil were kept by G. A. Perkins for two years under varying conditions of light, air, etc. Oxygen was found to be necessary for the development of rancidity, but not of acidity. The action of light increased the hydrolysis of the fat in sealed bottles, but, on the other hand, all samples exposed to the air in darkness became rancid. Enzymes soluble in fat (but not those insoluble) appeared to have a slight effect, especially in increasing the acidity, but sterilization of the oil had little, if any, beneficial effects. In the second stage of rancidity the free fatty acids were oxidized to an extent depending

upon the amount of hydrolysis. This oxidation was accelerated by light and moisture, but light was not an essential factor. An oil with a low initial acidity remained sweet after exposure to air and light for two years.—Philippine J. Sci., through J. Soc. Chem. Ind., 39 (1920), 458A.

Coconut Oil.—*Vitamines in.*—B. C. P. Jansen found by feeding coconut oil to rats that this oil is very poor in A-vitamines, just as is olive oil. He believes that the small size of the natives of the Dutch East Indian Archipelago is due to the use of this fat as food. —Med. Geneesk. Lab. Wellevreden, through Pharm. Weekblad, 57 (1920), 354. (H. E.)

Coconut Oil and Palm Oil.—*Solubility in Alcohol and Acetic Acid.*—According to J. R. N. Van Kregten, the solubility of coconut oil and palm kernel oil in alcohol and acetic acid may be employed for estimating the composition of mixtures of these oils, but previous estimations lack uniformity, as fatty acids were not removed. In obtaining the results tabulated below the coconut oil contained 0.032 per cent., and the palm-kernel oil 0.060 per cent. of fatty acids, calculated on a mol. wt. of 200. Different experiments showed a divergence of only ±1° C. The influence of water in the solvent on the critical temperature of solution is shown in the following table; 1 gramme of oil and 5 mils of the solvent were employed in each determination:

Solvent			Critical temperature of solution	
	Sp. gr. at 15°/15°C.	Vol. %	Coconut oil.	Palm-kernel oil
Alcohol	0.7942	99.96	20.2°C.	28.7°C.
	0.7981	99.16	30°C.	38.8°C.
	0.8001	98.75	35.5°C.	44.2°C.
	0.8020	98.36	39.5°C.	47.9°C.
	Sp. gr. at 15°.4°C.	% Acetic acid.		
Acetic acid...	1.0573	99.25	17.9°C.	32.5°C.
	1.0579	99.05	26°C.	41.5°C.
	1.0584	98.85	30.9°C.	46.5°C.

The critical temperatures of solution of various mixtures of the two oils are also given.—Oliën en Vetten, through J. Soc. Chem. Ind., 39 (1920), 305A.

Cockle-Bur Oil.—Leland B. Rhodes determined the physical and chemical characteristics of a sample of cold-pressed cockle-bur oil, and also some of the properties of the unpressed kernels. The oil is a drying oil with an iodine number of 140.8, saponification number 190.2. The kernels contain 29.89 per cent. oil and 40.34 per cent. crude protein.—J. Am. Chem. Soc., 42 (1920), 1507. (J. L. M.)

Cod Liver Oil.—*Effect of Chilling.*—According to Borisch cod liver oil when exposed to 0° for 3 or 4 hours, no separation of solid crystalline particles should take place.—Pharm. Ztg., through Drug. Circ., 64 (1920), 64.

Cod Liver Oil.—*Sulphuric Acid Reaction of.*—The Dutch pharmacopœia requires that when upon a few drops of cod liver oil in a porcelain container one drop of sulphuric acid is placed, a violet color is produced at the zone of contact of the liquids, the color changing gradually to red brown. A similar test is given in the U. S. P. Ph. J. de Kadt found that many absolutely genuine oils do not give the violet reaction, which apparently is due to the presence of lipochromes in the oil, but that a brown color is very frequently produced at once. Those oils which do not give the reaction are very probably such oils which have been bleached artificially by means of clay, Fuller's earth, charcoal, etc. By treating an oil which gave a positive reaction with sulphuric acid with animal charcoal and removing the oil from the charcoal by suction, an oil was obtained with which the reaction was negative. When the charcoal cake was extracted with carbon disulphide, the residue left after evaporating the solvent gave a deep violet color with concentrated sulphuric acid. The author further points out that concentrated acid should be replaced by an acid having the sp. gr. 1.72. By doing so the initial violet color is more liable to be obtained than by using the strong acid. He further points out that the reaction is more sensitive when sulphuric acid is added to a 5 per cent. solution of the oil in carbon disulphide, carbon tetrachloride, petroleum ether, benzene or chloroform, but in this case strong sulphuric acid has to be used. The author believes that the sulphuric acid test should be omitted from the pharmacopœia as identification test.—Pharm. Weekbl., 57 (1920), 756. (H. E.)

Cotton Seed Oil.—*Chemical Constitution of.*—Jamieson and Baughman call attention to the fact, although cotton seed oil has been an important article of commerce for a great many years, neither its quantitative nor qualitative chemical composition has been definitely established. Investigators agree that palmitic acid is the predominating saturated acid, but the presence of stearic and arachidic acids has been asserted and denied. Hehner and Mitchell found 3.3 per cent. of stearic acid in cotton seed oil stearin. Jamieson and Baughman summarize their study of the composition of a sample of cotton seed oil by the following results:

Glycerides of	Myristic acid	0.3%
	Palmitic acid	20.0%
	Stearic acid	2.0%
	Arachidic acid	0.6%
	Oleic acid	35.2%
	Linolic acid	41.7%
	Total	99.8%

—J. Am. Chem. Soc., 42 (1920), 1197. (J. L. M.)

Hydrogenated Cotton Seed Oil.—*Use as an Ointment Base.*—W. W. McNeary claims that this substance seems to be the most suitable of the various hydrogenated oil products for use as an ointment base. He states that it has been known to have kept fresh for two years. It can be sterilized; does not granulate like lard on standing; retains its consistency in hot weather and is easily manipulated at 12° F. It can be hydrogenated to any degree of consistency and seems to be as readily absorbed by the skin as lard.

Comparisons made in a large hospital with lard and petrolatum, each containing zinc oxide showed that the cotton seed oil dressing becomes as dry as lard in about the same length of time; the petrolatum ointments only remaining greasy. The writer recommends that the Revision Committee give due consideration to its admission to the Pharmacopœia and that standard of melting point and other physical characteristics be made.—Proc. Penna. Phar. Assoc., 43 (1920), 152. (L. S.)

Fir Seed Oil.—O. Von Friedrichs reports that the fatty oil, as obtained by extraction with ether in Sweden from the seeds of

Picea abies, is a pale yellow mobile oil, with a somewhat bitter taste, recalling that of turpentine, and a faintly aromatic odor. A sample had the following characters: Sp. gr. at 15° C. 0.9295; solidification point,—26° C.; $[n]_D^{18} = 1.4801$, $[n]_D^{40} = 1.4718$; acid value, 1.0; saponification value, 191.8; iodine value (Hanus), 154; Hehner value, 92.65; and Reichert-Meissl value, 1.06. The oil contained 91.6 per cent. of nonvolatile acids composed of 0.7 per cent. of palmitic acid and 99.3 per cent. of unsaturated acids (oleic 42.75, linolic 49.55, linolenic 7.7 per cent.). It also contained about 0.14 per cent. of butyric acid. The phytosterol had the characteristics of sitosterol.—Svensk. Farm. Tid., through J. Soc. Chem. Ind., 39 (1920), 304A.

Oil of Gleditschia Seeds.—F. Kryz reports that the seeds of the black locust (*Gleditschia triacanthus*) yielded on extraction with ether a viscous yellow neutral oil, which had a faint odor but no taste. The seeds contained a catalase, a peroxydase, and a lipase. On mixing 2 grammes of the finely powdered and sifted seeds with 20 grammes of neutral olive oil and 10 mils of neutralized xylene water, and leaving the mixture at 20° for four days, the amount of fatty acids liberated corresponded to 11.0 mils of N/2 sodium hydroxide solution. No better results were obtained by adding acid, manganous sulphate, or powdered nickel to the powdered seed, which additions have been found to stimulate the lipolytic activity of castor seed. The lipase of *Gleditschia* seeds is much less active than the castor seed enzyme.—Oesterr. Chem. Ztg., through J. Soc. Chem. Ind., 39 (1920), 240A.

Lard.—*Melting Point Modified by Feed.*—J. M. Scott reports that the melting point of the fat of hogs fed on peanuts for forty-five days was lowered by 3.1 to 5.5°. Hogs fed on corn, shorts, and cotton-seed meal for forty-four days produced fat which had a higher melting point of from 1.7° to 5.0° above the normal. Corn, shorts, peanut meal with hulls, and skim milk produced fat which was from 1.8 to 4.2° above the normal melting point. The individuality of the hog is also a factor in the variation of the melting point of its fat.—Bull. Fla., Agric. Exp. Stat., through Pharm. J., 105 (1920), 490.

Hubbard Squash Seed Oil.—*Composition of.*—Baughman and Jamieson find that the seed of *Cucurbita maxima* yield 36.66 per cent.

of ether extract and that the extracted oil has the following constants:

	Oil.	Insoluble acids.	Liquid acids.	Solid acids.
Specific gravity 25°/25°	0.9179	....	....	....
Refractive index 25°	1.4714	....	....	....
Iodine number (Hanus)	121.0	....	151.2	3.8
Saponification value	191.5	201.8	201.7	210.3
Mean molecular weight		278.0	278.1	266.8
Reichert-Meissl number	0.37	....	....	....
Polenske number	0.39	....	....	....
Acetyl value	27.8	....	....	....
Acid value	0.50	....	....	....
Unsaponifiable matter, per cent	1.06	....	....	....
Soluble acids, per cent	0.33	....	....	....
Insoluble acids, per cent	94.66	....	....	....
Unsaturated acids, per cent	76.45	....	....	....
Saturated acids, per cent	18.37	....	....	....
Titer	....	29.8° to 29.85°		

The oil, they find has the following composition:

		Per cent.
Glycerides of	Palmitic acid	13
	Stearic acid	6
	Arachidic acid, trace about	0.04
	Oleic acid	37
	Linolic acid	44
Unsaponifiable matter		1.

—J. Am. Chem. Soc., 42 (1920), 152.

Lard.—*Preparation of Benzoinated.*—G. Van Nerom mixes 1000 grammes of fresh lard, 40 grammes of powdered Siam benzoin and 20 to 30 grammes of powdered potassa alum. These he mixes in the cold and after three days' contact, he warms the mixture on a water bath during two or three days or until "the odor of the hog" has disappeared. Then the mixture is melted and is filtered by use of a hot water funnel. Such a benzoinated lard not only has a delightful odor but has remained sweet for five years.—J. Pharm. Belg., through J. pharm. chim., 22 (1920), 21.

Lemon Seed Oil.—The "pastazzo" or residue from washing citrate of calcium, etc., in the manufacture of citric acid contains a large quantity of pips. P. Bertolo considers that this waste product, of no commercial value, could be profitably utilized for oil extracted by pressure or with solvents. By the last method the yield is 30 to 35 per cent., according to the degree of maturity. The oil from the press is light yellow and rather fluid with the odor of lemon and tart in flavour. That extracted with solvents is somewhat turbid and gives a considerable volume of pasty sediment consisting chiefly of solid saponifiable matter. The oil is semi-siccative and resembles cottonseed oil, containing a very high percentage of liquid glycerides and less than 28 per cent. solid.—Gior. Chim. App., through Chem. News, 121 (1920), 322.

Linseed Oil.—*Determination of the Hexabromide Value.*—Hehner and Mitchell's method of determining the amount of linolenic hexabromide yielded by the fatty acids of linseed oil has been modified by Steele and Washburn by effecting the bromination in a solvent in which the hexabromide is soluble (*e. g.,* chloroform), removing the excess of bromine by the addition of a reagent (amylene), separating the hexabromide and washing it thoroughly with ether previously saturated with hexabromide. The amount of hexabromide thus separated from the fatty acids of seven different samples of linseed oil ranged from 45.6 to 46.6 per cent., duplicate determinations agreeing within about 0.5 per cent. Apparently, therefore, the yield of hexabromide is a more constant value than the iodine value of raw linseed oil. Cottonseed and tung oil fatty acids gave no precipitate, whilst a sample of soya bean oil yielded 2.2 per cent. Experiments with mixtures indicated that it may be possible to detect 5 per cent. of oils low in hexabromide yield in linseed oil by this method.—J. Ind. Eng. Chem., 12 (1920), 52.

The yield of hexabromide and amount of unsaponifiable matter in linseed oil are determined by H. Wolff in one operation: 5 grammes of the oil are boiled for 15 minutes beneath a reflux condenser with 30 mils of 5 per cent. alcoholic potassium hydroxide solution, the mass dissolved in 50 mils of hot water, and the soap solution rapidly cooled and transferred to a separating funnel, the flask being twice rinsed with 5 mils of water. It is then shaken with about 100 mils of petroleum spirit. The lower layer is transferred to a second separating funnel, acidified with a slight excess of hydrochloric acid, and.

after the addition of about 5 grammes of sodium chloride, shaken with ether. The ethereal extract is separated, dried with anhydrous sodium sulphate and filtered into a weighed flask. The solvent is evaporated on the water-bath, while a current of dry carbon dioxide is passed through the flask, and the residue of fatty acids dissolved in 50 mils of ether. Ten mils of solution are acidified with 1 drop of glacial acetic acid in a weighed centrifugal bottle, and then with 1.0 to 1.2 mils of bromine, added drop by drop at –10° to 0°. After standing for 2 hours in the freezing mixture the ethereal solution is centrifuged, the ether decanted, the precipitate stirred with about 2 mils of chilled ether and again centrifuged. This process is repeated and the washed precipitate is dried at 110° and weighed. The amounts of hexabromide yielded by different linseed oils may vary up to 8 per cent., and the method is therefore preferable to that of Steele and Washburn, in which the yields are about 3 per cent. lower, but fairly constant for different oils.—Farben Ztg., through J. Soc. Chem. Ind., 39 (1920), 417A.

Linseed Oil.—*Standards for.*—J. Prescher discusses the various constants of and tests for linseed oil. His conclusions are that an oil having the iodine number 170, the saponification number 192, and having good drying properties, is to be considered pure.—Pharm. Zent., 61 (1920), 391.

Linseed Oils.—*Substitutes for.*—Different combinations of Guiana wood oil, fish oil, and soja oil have been utilized with variable success. A method of manufacture consists in heating a fine quality fish oil for 2 hours at 240°, then distilling with steam at 375° to 400° during 30 hours. Thus, a thick elastic material is obtained which has very good siccative properties. Another method is to heat the oil with 15 per cent. water and 0.5 per cent. sulphate of manganese in an autoclave during 3 to 5 hours at a pressure of 10 atmospheres. The conclusion arrived at, according to Bruckhams, is that practically it is impossible to find a substitute for linseed oil, especially in manufacture of lakes. The mixed varnishes are made with boiled soja, sunflower, and linseed oils.—Seifensiedler Ztg., through Chem. News, 121 (1920), 311.

Lumbang Oil.—*Comparison to Linseed Oil.*—R. H. Aguilar examined two samples of Lumbang oil which he obtained by expres-

sion from the seeds of two species of Euphorbiaceæ from the Phillippines; *Aleurites moluciana* and *Aleurites trisperma*. The yield of oil was about 41 to 43 per cent. This oil compared to linseed oil is as follows:

	Linseed Oil	Lumbang Oil I	Lumbang Oil II
Spec. Grav. 15°....	0.9345	0.9252	0.9368
Acid value.....	0.5	1.05	8.7
Saponification value.	198.4	192.9	197.7
Iodine value.....	184.0	150.4	145.2

Several practical experiments with lumbang oil and linseed oil using kieselguhr and red lead for coloring and testing the films for elasticity and water absorption proved linseed oil to be superior to lumbang oil in every respect.—Pharm. Zent., 61 (1920), 374. (O. M.)

Mutton Bird Oil.—This oil, obtained from the stomach of the sooty petrel, has been recommended as a substitute for cod liver oil. Evers and Foster find that it bears little resemblance to cod liver oil in chemical characters and deem it undesirable because of the large amount of unsaponified matter present. Chemical constants for two samples are stated in the article.—Pharm. J., 105 (1920), 100. (C. W. B.)

Mycosterin.—*A New Phytosterol.*—Ikeguchi has extracted from four species of mushrooms, *Armillaria edodes, Hydnum asparatum, Collybia shütake* and *Lycoperdon gemmatum,* a new phytosterol, $C_{30}H_{48}O_2$, occurring in crystalline masses melting at 159° to 160°, having the optical rotation, $\alpha_D = 129.23°$ to 129.55°, yielding upon oxidation with chromic-acetic acid mixture a substance, $C_{30}H_{48}O_3$, melting at 188° to 189°.—J. Biol. Chem., through J. pharm. chim., 22 (1920), 31.

Okra Seed Oil.—*Composition of.*—Baughman and Jamieson find that the seed of *Abelmoschus esculentus* contain 15.6 per cent. of oil, four different samples of which showed the following constants:

Sample number.	1.	2.	3.	4.
Iodine number (Hanus).	93.2	100.3	95.5	95.2
Saponification number...	195.5	195.6	195.6	195.2
Polenske number.....	....	....	....	0.23
Reichert-Meissl number..	....	....	....	0.26
Acetyl value	23.9	16.2	11.5	21.4
Acid value.....	....	0.66	0.34	1.42
d^{25}_{25}	0.9187	0.9182	0.9160	0.9172
Refractive index at 25°..	1.4692	1.4693	1.4695	1.4702
Unsaponifiable matter, %.	....	....	....	0.37
Soluble acids, %.....	....	0.12	0.09	0.14
Insoluble acids, %.....	....	95.90	96.27	96.20
Unsaturated acids, %....	....	....	....	67.33
Saturated acids, %.....	....	....	....	29.22

Sample No. 4 had the following composition:

Glycerides of.	Per cent.
Palmitic acid	27.23
Stearic acid	2.75
Arachidic acid	0.05
Oleic acid	43.74
Linolic acid	26.62
Unsaponifiable matter	0.37

—J. Am. Chem. Soc., 42 (1920), 166.

Olein and Stearin.—*Action of Mannitol on.*—Lapworth and Pearson found that when the above fat bases were treated with mannitol under reduced pressure in the presence of sodium ethylate, the mannitol replaced the glycerine in the oleic or stearic ester and thus dioleates and distearates of mannitan were obtained.—Biochem. J., through J. pharm. chim., 21 (1920), 280.

Olive Oil.—*Adulteration of.*—Jules Cofman-Nicoresti reports that a number of samples of olive oil recently examined were grossly adulterated with tea-seed oil, which has been condemned as an edible oil due to the presence therein of a poisonous saponin body. The various commercial tea-seed oils possess physical constants very similar to olive oil and do not respond to Baudouin's or Halphen's tests. It may be detected by shaking 10 mils of the sample oil with 10 mils of a mixture of equal parts by weight of concentrated sul-

phuric acid, concentrated nitric acid and water. If tea-seed oil exceeding 20 per cent. is present, a distinct pink color will develop in the oily layer. If less than 20 per cent. is present, the pink color is hardly distinguishable. Heating on a water-bath for 20 minutes tends to deepen the color. Some other oils, notably cotton-seed oil, also respond to this test but no pure olive oil does so.—Pharm. J., 104 (1920), 139. through Bot. Abs. (E. N. G.)

Olive Oil.—*Italian Production.*—A. A. Osborne reports that the yield of this oil, although more than the average for the last ten years, is insufficient for this country's consumption. The monthly requirements amount to about 130,000 quintals, and the most favorable estimates for this year's production go no higher than 1,300,000 quintals for the whole year. The writer points out that a substantial portion of Italy's olive oil requirements will have to be met by importations. For this imported oil the market price will have to be paid, as it will not be subject to regulation by the Italian Government. The only price policies left open to the government regarding this imported oil are two: (1) To sell the imported oil to the consumer at the domestic price, the government bearing the loss; (2) to raise the fixed price of domestic oil so as to accord with the price paid for the imported oil.—Am. J. Pharm., 92 (1920), 37. (J. K. T.)

Olive Oil.—*Lipolytic Enzymes in.*—M. Rector states that chemically untreated and filtered olive oil contains a fat hydrolyzing enzyme, that retains its activity for a number of years, but which is partially destroyed at 75° and totally at 150° when kept at these temperatures for 15 minutes or longer.

A lipolytic anti-ferment was found in the water-in-oil emulsion known as "foots" which almost completely inhibited the action of the lipolytic enzyme.—J. Ind. Eng. Chem., 12 (1920), 156. (L. A. B.)

Palm Oil.—The Dutch are finding the cultivation of the oil palm more profitable than that of the coconut palm. The latter gives a crop worth approximately 360 gulders per hectare; whereas the value of the coconut crop reaches 418 to 1,307 gulders per hectare. As dichromate in recent years has been a rather expensive bleaching agent for palm oil, the producers have been using a simple method of bleaching by air oxidation. Through the open tank containing the

oil is passed by means of a rope and pulley arrangement, an iron sieve with small openings, the mechanism being so adjusted that the sieve moves to and fro and at each end of the space travelled it rises into the air, when the oil in the sieve runs out through the meshes. After several hours of such treatment, the oil is bleached to a considerable extent.—Chem. Umschau, through Pharm. Zent., 61 (1920), 482.

Perilla Oil.—Gardner and Holdt report that perilla seed contain 33 to 35 per cent. of a greenish-yellow or brownish oil of characteristic agreeable odor which in many respects resembles linseed oil. It dries to a tough film slightly more slowly than raw linseed oil, but the acceleration of oxygen absorption with the addition of a drier appears to be greater than is the case with linseed oil. Its most obvious defect is the tendency of the film to "crawl" or "creep" into droplets on a surface, a fault which can be inhibited by increasing its viscosity by bodying-up (blowing) or by admixture with an oil of lower surface tension, *e. g.,* linseed or soya bean oil. A sample of perilla oil secured direct from the Orient had the following characters: Sp. gr. at 15.5°, 0.9354; moisture and volatile matter, 0.07 per cent.; acid value, 7.0; iodine value, 198.8; saponification value, 193.1; unsaponifiable matter, 1.07 per cent.; $n_D^{25}=1.4802$. The wetting power of perilla oil is greater than that of linseed oil as measured by the determination of the oil absorption of pigments, 20 grammes of lithopone absorbing 4.7 mils and 5.2 mils of the two oils respectively. The oil shows no separation of mucilage on heating quickly to 310°, and little darkening in color takes place at this temperature, thus indicating its suitability for the manufacture of pale varnishes. As a paint vehicle perilla oil is equal to linseed oil in regard to weathering; the "creeping" effect observed when it is used in conjunction with white lead may be corrected by previously heating the oil to 260° or mixing it with a proportion of raw linseed oil.—Circ. Paint Mnft. Assoc., through J. Soc. Chem. Ind., 39 (1920), 789A.

Pine Seed Oil.—O. Von Friedrichs reports that the fatty oil from the seeds of *Pinus silvestris* is a light, yellow, mobile, nearly odorless oil. A sample had the following characters: Sp. gr. 0.9307; solidification point, —30° C.; $[n]_D^{18}=1.4799$, $[n]_D^{40}=1.4714$; acid value, 0.92; saponification value, 190.7; Hehner value, 94.75; Reich-

ert-Meissl value, 0.79; and iodine value (Hanus), 159.2. The oil contained about 0.11 per cent. of volatile fatty acids, mainly butyric acid. There was 90.4 per cent. of non-volatile fatty acids, 7.5 per cent. glycerol, and 1.29 per cent. of crude phytosterol (melting point, 135°). The fatty acids consisted of about 3 per cent. of solid fatty acids (palmitic acid, with 5 per cent. of stearic acid) and 97 per cent. of liquid acids (36.2 per cent. oleic, 56.2 per cent. linolic, and 7.6 per cent. linolenic acid.)—Svensk Farm. Tid., through J. Soc. Chem. Ind., 39 (1920), 304A.

Prickly Pear Seed Oil.—S. Lomanitz finds that prickly pear seed contain 7.68 per cent. of water, 2.96 per cent. of ash and 10.89 per cent. of a greenish-yellow, odorless oil; the constants of which were:

Specific gravity, 15.5/15.5	0.9294
Acid number	3.09
Free fatty acids, as oleic acid	1.55
Saponification value	189.5
Iodine number	116.30
Ester number	186.47
Reichert-Meissl number	2.8
Hahner number	93.81
Index of refraction, n^{40}_{D}	1.46764

—J. Ind. Eng. Chem., 12 (1920), 1175.

Proso-Millet Oil.—*The Characteristic Alcohol of.*—Dunbar and Binnewies have carried out a series of investigations with proso-millet seed which, while as yet open to further work, have brought out several interesting details, when viewed from the standpoint of the cereal analyst.

They summarize the results of their present investigation as follows: The oil of proso-millet is a semi-drying oil, capable of classification in this regard, with oils of sesame, rape and peanut.

It is essentially composed of glycerides of the following fatty acids: palmitic, oleic, linolic, iso-linolic, and, in smaller percentages, carnaubic and daturic acids. The solid acids from such an oil can best be separated through their fractional precipitation from a series of varying concentrations of alcohol in water, with fairly constant differences between successive concentrations.

The bromination method seems inadequate for the satisfactory separation of individual members of the unsaturated fatty acids from similar oils. A ketone alcohol, insoluble in water, soluble in certain organic solvents, and possessing certain properties similar to those of a phytosterol, is a by-product in the preparation of this oil, as the authors prepared it for analysis. So far as they have been able to ascertain, this product has not been discussed in the literature pertaining to plant products.—J. Am. Chem. Soc., 42 (1920), 658. (J. L. M.)

Oil of Rice.—K. Takahaski had the opportunity of analyzing two ancient samples of rice; one 160, the other 280 years old. Both samples gave figures resembling those of our present rice, except for the great difference in the oil content.

Takahaski also studied four samples of rice oil; A from North Japan; B from South Japan; C from Korea; D from Formosa. His findings are tabulated below:

	A.	B.	C.	D.
Density at 15°	0.9236	0.9254	0.9276	0.9208
Refraction number	67.	.....	68.5	.....
n_D at 60°	.....	1.465	.....	.....
Acid number	122.2	14.4	11.9	81.3
Saponification number	189.9	183.3	183.5	192.2
Hehner number	96.6	96.0	92.1	94.0
Reichert-Meissl number	0.6	0.7	1.2	1.7
Iodine number	105.8	104.7	108.6	103.1
Unsaponifiable	3.7	4.0	4.2	3.9

The fatty acids were: palmitic, 18.9 to 20.0 per cent.; arachic, 3.5 to 4.35 per cent.; behenic, 0.5 to 0.6 per cent.; oleic, 45 to 47.2 per cent.; linoleic, 30 to 34.8 per cent.—Chem. Umschau, through Pharm. Zent., 61 (1920), 646.

Rubber Seed Oil.—L. Lewton-Brain states that the experimental hydraulic oil-expression plant of the Agricultural Department of the Federated Malay States has been lent to the Malayan Oil Mills, Ltd., a local company formed primarily to manufacture rubber seed oil. It has been ascertained that seed on storage deteriorates and produces an oil containing up to about 25 per cent. free fatty acids, and that such oil is not generally suitable as a substitute for

linseed oil. Further, this oil is not suitable for many purposes owing to its slower drying power, compared with linseed oil, and it is necessary to prepare a "boiled" oil for commercial purposes.

Considerable progress has been made in the work of refining the oil, but it is probable that the processes required can only be carried out in a factory under the supervision of a trained chemist. Experiments on the preparation of "boiled" oils have shown that a satisfactory product can be obtained from a raw oil free from fatty acids.

A further problem, namely, the prevention of the deterioration of seed on storage, remains to be attacked. Freshly collected seed yields an oil with very low acid content.—Chem. News, 121 (1920), 206.

A. Dubesc has studied the same oil. For details see the original article.—Caoutchouc et Guttapercha, through Pharm. Zent., 61 (1920), 312.

Sambucus Racemosa.—*Oil of.*—Thoms reports that the seeds of the berries of *Sambucus racemosa*, mountain elder, contain 30 per cent. of a drying fatty oil which consists chiefly of the glycerin esters of oleic, linolic and linoleic acids, in addition to the esters of stearic and palmitic acids. The oil, which has a specific gracity of 0.9242 to 0.9439, an acid value of 3.07 to 29.24, saponification value of 186.9 to 198.1, and an iodine value of 156.3 to 177.4, has toxic properties, which, however, can be removed by heating the oil at 200°.—Ber. dtsch. Pharm. Ges., through Drug. Circ., 64 (1920), 180.

Sesame Oil.—The late war has added largely to the number of experiments made in India with a view to making articles produced there more useful to the world at large. One of the most interesting of these was undertaken by two Indian chemists in the Punjab University with a view of making til seed or sesame oil more useful in the preparation of edible fats. This oil possesses many valuable qualities, and is largely used by millions of Indians for cooking. Before the war it was exported to France and Italy, and much of the so-called olive and Lucca oil sold in those countries is composed of it. The color and odor of the oil are sometimes objected to by those who use it at first, and in Calcutta the higher classes who have from their childhood been accustomed to use ghi for cooking would never substitute til seed oil for it. This is a prejudice which, however, exists only among a very few, and many Europeans who have

tried it, appreciate it, and have adopted the cheaper substitute. The fact that it is largely used in France and Italy in the making of the "salad oil" shows conclusively that there is no insurmountable objection either to the color or odor of sesame oil. The cultivation of the plant is largely extending in India, where it can be grown successfully and economically in various kinds of soil, and in climates where the rainfall differs considerably. After the grains, which form the food of India's millions, it would be difficult to mention any single article other than sesamum or til seed more advantageous to the country on which increased attention might more worthily be bestowed, and this, whether we look upon it as a most valuable article of export for which there will always be an increasing demand in Europe, or as a nutritious food for the people, supplying them with what they most require for healthy sustenance, and at smaller cost.—Chem. & Drug., through Am. Drug.

Soy-Bean Oil.—*Color Test for.*—C. A. Newhall recommends a modified Settini test, viz.: Five mils of chloroform are added to 5 mils of the oil, mixed in a small test tube with a few drops of gum arabic solution and 5 mils of a two per cent. solution of uranium nitrate or uranium acetate, and shaken to form a thorough emulsion. All samples of crude and refined soy-bean oil so far examined give a characteristic lemon-yellow emulsion, whereas no other oil so far tested gives this color.—J. Ind. Eng. Chem., 12 (1920), 1174.

Soy-Bean Oil.—*Composition of*—W. H. Low found a sample of filtered soy-bean oil contained 94.96 per cent. of pure fatty acids, 1.16 per cent. of non-saponifiable matter and 10.37 per cent. of glycerin. Its acid number was 279.3 and its Wijs iodine number was 138.45. Details of the chemical examination including a description of a fatty acid filter devised by the author are given in the paper.—J. Ind. Eng. Chem., 12 (1920), 572.

Sunflower Oil.—*As Cod Liver Oil Substitute.*—In Austria, cod liver oil is very scarce and physicians and pharmacists have found in sunflower oil a good substitute in the preparation of a phosphorated oil.—Chem. Industrie, through Pharm. Zent., 61 (1920), 59.

Wool-Fat.—*Iodine Number of.*—B. M. Margosches finds, after a number of analyses, considerable discrepancies in the Hübl and the Wijs iodine number of wool-fat and in the ratio between the two methods. His findings are tabulated below:

	Hübl Number	Wijs Number
Crude wool fat	21.2 to 26.4	42.9 to 60.1
Wool fat	18.8 to 24.1	47.8 to 66.5
Wool fat (high purity)	13.0 to 19.1	59.5 to 76.1
Lanolin	13.2 to 15.9	59.8 to 77.3

—Chem. Umschau, through Pharm. Zent., 61 (1920), 156.

Wool-Fat.—*Iodine Value Determination of.*—E. J. Hughes points out the influence of quantity of fat and of time of maceration upon the iodine value of wool fat. With olive oil, the factors are of less influence as is shown in the following table:

Olive Oil Weight Used	Amount of Hanus Solution	Time Allowed	Iodine Figure
.117 Gm.	25 mils	1 hour	92.19
.259 Gm.	25 mils	1 hour	90.23
.382 Gm.	25 mils	1 hour	89.14
.534 Gm.	25 mils	1 hour	87.23

On the other hand, with wool fat, the discrepancies are very marked, as the following tables show:

VARIATION OF QUANTITY

Wool Fat No. 1 Weight Used	Amount of Hanus Solution	Time Allowed	Iodine Figure
.600 Gm.	25 mils	1 hour	32.02
.700 Gm.	25 mils	1 hour	29.82
.800 Gm.	25 mils	1 hour	28.20
.900 Gm.	25 mils	1 hour	26.22
1.000 Gm.	25 mils	1 hour	23.48
1.100 Gm.	25 mils	1 hour	20.95

Wool Fat No. 2 Weight Used	Amount of Hanus Solution	Time Allowed	Iodine Figure
.700 Gm.	25 mils	1 hour	27.71
.800 Gm.	25 mils	1 hour	25.89
.900 Gm.	25 mils	1 hour	24.15
1.000 Gm.	25 mils	1 hour	22.33
1.100 Gm.	25 mils	1 hour	21.17
1.200 Gm.	25 mils	1 hour	19.97

Wool Fat No.3 Weight Used	Amount of Hanus Solution	Time Allowed	Iodine Figure
.600 Gm.	25 mils	1 hour	31.03
.900 Gm.	25 mils	1 hour	24.47
1.200 Gm.	25 mils	1 hour	19.90

VARIATION OF TIME

Wool Fat Weight Used	Amount of Hanus Solution	Time Allowed	Iodine Figure
1.000 Gm.	25 mils	30 minutes	21.74
1.000 Gm.	25 mils	1 hour	23.18
1.000 Gm.	25 mils	2 hours	24.37
1.000 Gm.	25 mils	3 hours	25.43

When the quantity of Hanus' solution is adjusted to the increased quantity of wool fat, concordant results are obtained as shown in the following table:

Wool Fat No. 4 Weight Used	Amount of Hanus Solution	Time Allowed	Iodine Figure
.800 Gm.	20 mils	1 hour	20.28
1.200 Gm.	30 mils	1 hour	20.62
Wool Fat No. 1.			
.800 Gm.	25 mils	1 hour	28.20
1.600 Gm.	50 mils	1 hour	28.90

Hughes concludes that the Pharmacopœia should direct in the iodine number determination the use of "exactly 0.800 gramme," instead of the present "about 0.800 gramme."—Proc. Pa. Pharm. Assoc., 43 (1920), 292.

Wool-Fat.—*"Oily Acid" of.*—The experiments of I. Lifschütz indicate that the acid portion of wool fat contains no oleic acid or other unsaturated fatty acid. After repeated purification, the so-called "oily acid" gives no reaction for oleic acid with chromic and sulphuric acids, and the low iodine value previously ascribed to this "oily acid" probably depends on the presence of an acid formed by the oxidation either of cholesterol or, as the absorption spectrum indicates, of isocholesterol.—Z. Physiol. Chem., through J. Soc. Chem. Ind., 39 (1920), 697A.

Wool-Fat.—*Saponification, Acid and Iodine Number of.*—Tests made with crude wool-fat obtained from different geographical sources gave the following results:

	Acid Number	Saponification number	Iodine Abs. Number	Total Acid No.	Unsaponifiable
New Zealand....	14.3	106. -108.8		....	36.6-43.9
South America.	13.2	82.2- 91.4	21.1	96.7	43.1-43.6
Australia	15.5	102.5-103.5	10.2	101.0	
Russia.....	13.9	78.8- 87.3	....	114.8-121.2	38.7-39.1

The saponification number was obtained by boiling ½ hour with N/2 alcoholic potassium hydroxide solution, the unsaponifiable part by extracting the lime soap with acetone. The total acid number refers to the mixture of the unsaponifiable part and fatty acids again separated after saponification.

Wool-fat is capable of absorbing about 105 per cent. of its weight of water, the absorption power may be increased by the addition of beeswax or olive oil. Wool-fat is rapidly absorbed by the skin, a short time after using iodine salve made with lanolin base, the iodine may be detected in the urine. This is not the case when petrolatum or lard base is used.—Pharm. Zent., 61 (1920), 368. (O. M.)

Yeast Fat.—*Nature of.*—MacLean and Thomas report that crude yeast fat is a brown liquid with a high iodine value and a low saponification value, and has a large proportion (25-45 per cent.) of unsaponifiable matter. It may contain as much as 20 per cent. of a sterol, apparently identical with ergosterol, partly in the free state and partly as fatty acid esters. Palmitic, oleic, and linolic acids have

been identified with certainty in yeast fat, and there is evidence for the presence of lauric and possibly arachidic acids.—Biochem. J., through J. Soc. Chem. Ind., 39 (1920), 604A.

CARBOHYDRATES.

Caramel.—*Furfural in.*—Plaisance and Monsch point out the presence of furfural in caramel and the fact that this substance is more or less toxic. They also point out, however, that when the food containing caramel is cooked, the furfural evaporates.—J. Home. Econ., through Am. J. Pharm., 92 (1920), 603.

Cellobiose.—*Biochemical Synthesis of.*—This substance, sometimes called *cellose,* was first obtained by Skraup and Koenig (Proc. Am. Pharm. Assoc., 1902, 1014) as a hydrolysis product of paper. Bourquelot, Bridel and Aubry now report its synthesis from glucose. Thus when glucose is treated with emulsin at 15 to 20° C. a syrup having the optical rotation of +15.9° is obtained. This syrup, as has already been reported (YEAR BOOK, 1919, 538), contains gentiobiose, but as that biose has a rotation of only + 10.2° it is obvious another biose of greater rotation must be present. Cellobiose has a rotation of +33° to +34°.

Turning to the syrup left after crystallization of the gentiobiose in the 1919 experiments, the authors were able to extract therefrom in well defined crystals the cellobiose sought for.—J. pharm. chim., 21 (1920), 129.

Celloisobiose.—This new biose $C_{12}H_{22}O_{11}$, has been isolated by Ost and Prosiegel from the productof acetylation of cellulose in presence of considerable quantities of sulphuric acid at 15° to 30°. It forms fine needles with a slightly sweet taste which melt indefinitely at 165 to 190° with evolution of gas; $[a]=+23°$ in aqueous solution. Its reducing power is 99 per cent. of that of maltose. It is not fermented by top-fermentation yeast, but readily yields dextrose when treated with hydrochloric acid.—Z. angew. Chem., through J. Soc. Chem. Ind., 39 (1920), 421A.

Cellulose.—*Levo-glucosan from.*—Upon distilling cotton cellulose at 15 mm. pressure, Pictet and Sarasin obtained at 210° a frac-

tion, a yellow viscid oily liquid from which, by clarification with animal charcoal and by recrystallization, they isolated colorless needles having the formula $C_6H_{10}O_5$. This crystalline body, which they call levo-glucosan is levogyrate and upon hydrolysis yields dextrose.—Drug. Ztg., through Pharm. Zent., 61 (1920), 693.

Dextrose and Levulose.—*Separation of.*—Lucius reports that when a 2 to 4 per cent. solution of dextrose and levulose is heated with hydrochloric acid for seven hours, the optical activity of the levulose is completely destroyed, while that of dextrose remains unchanged. Since the levulose is converted into other reducing substances a determination of dextrose cannot be effected by estimating the reducing power of the solution. It can, however, be done polarimetrically. Fifty mils of the solution of the two sugars are heated for seven hours on a boiling water bath with 10 mils of 18 per cent. hydrochloric acid; the liquid is then neutralized with 20 per cent. sodium hydroxide solution, diluted with water to 100 mils and polarized at 20° in a 200 mm. tube. If necessary, the solution is decolorized by means of animal charcoal. The method is suitable for the determination of dextrose in the presence of invert sugar. A heating of the mixture for more than seven hours causes a decrease of the rotation of the dextrose.—Z. Untersuch. Nahr. Genussm., through Drug Circ., 64 (1920), 217.

Ethylcellulose.—*Acetolysis of.*—Hess and Wittelsbach suggest that the molecule of hydrocellulose (celluxose), consists of a dextrose or a cellobiose molecule in which the hydroxyl groups are etherified by dextrose or cellobiose residues. Of the various possibilities, the formula

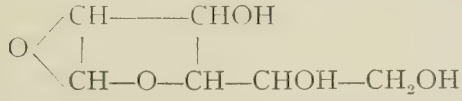
$$\begin{array}{l} CH.(OX).CH.(OX).CH.(OX).CH.CH(OX).CH_2OX, \\ \quad\vert\qquad\qquad\qquad\qquad\qquad\vert \\ \quad\vert\!\!-\!\!-\!\!-

in the form of acetates when the maximum proportion of cellobiose acetate is not reached, are looked on as mixed partial degradation products of the cellulose molecule, resulting from the removal by hydrolysis in a variety of ways of one or more dextrose or cellobiose residues. Experiments on the acetolysis under very mild conditions of ethylcellulose uniformity confirmed the deduction from the above formula that when degradation has proceeded sufficiently far, the ethoxy number of the ethyldextrin acetates produced should be less than that of the ethyl dextrose; this result is not explained by the older formulæ. The marked difference between cellulose and its derivatives, e. g., nitrate, acetate, and the products obtained by the action of acids, alkalis, or zinc or copper ammonium compounds is accounted for by considering such derivatives to be derived from the above formula, whilst cellulose consists of a number of such molecules, united through residual affinities of hydroxyl groups. The disintegrating effect of the agents named is due to their competition for these residual valencies. It is also suggested that the physical characteristic of cellulose as a hollow fibre is reproduced in the arrangement of the celluxose molecules in the cellulose complex, and that this complex may be broken down by mechanical means, *e. g.,* in the case of cellulose which has been subjected to prolonged beating or grinding; the product thus obtained represents a stage of disintegration approaching the less profound of those produced chemically. Similar considerations may apply to the molecules of hemicelluloses, protein, and caoutchouc.—Z. Elektrochem., through J. Soc. Chem. Ind., 39 (1920), 512A.

Fructose.—*Enzyme Hydrolysis of.*—Peterson and Fred find that when fructose is treated with *Lactobacillus pentoaccticus* it breaks down into acetic and lactic acids, mannitol and carbon dioxide. If the mixture for ten days or over, the mannitol is hydrolyzed into lactic and acetic acids. After a still longer time, the lactic acid is broken into acetic acid.—J. Biol. Chem., through J. pharm. chim., 22 (1920), 231.

Glucosan.—Gélis (1860) discovered that if glucose is heated to 17°, it loses water and is converted into a brown amorphous substance which is no longer fermentable. His opinion was, that this substance was an anhydride of glucose, having the formula $C_6H_{10}O_5$,

to which he gave the name glucosan, but he never isolated it in a state of purity. E. Bourquelot has continued these investigations and has been able to isolate it in a chemically pure state, by slightly modifying the method adopted by Gélis. M. Bourquelot heated glucose to a temperature of 150 to 155° under a reduced pressure of 15 mm. of mercury, when water is given off, without oxidation or decomposition. On cooling an almost colorless solid is obtained. This is subjected to the action of absolute alcohol, which frees it from traces of glucose that have escaped dehydration. It is then crystallized in vacuo from the methyl alcohol solution, when colorless crystals, melting at 108 to 109° are deposited. These are pure glucosan. Analysis gives it the formula $C_6H_{10}O_5$. Glucosan is extremely hygroscopic, but it is not transformed into glucose. It cannot be distilled even in vacuo without decomposition. It is very soluble in water, fairly so in methyl alcohol and in acetic acid, slightly soluble in ethyl alcohol, and insoluble in other organic solvents. It is dextrorotatory, its rotatory value in aqueous solution is a little higher than that of glucose, and for a concentration of 3.84 per cent. is equivalent to +69.8°. It reduces Fehling's solution, but does not redden fuchsin solution decolorized by sulphurous acid. The most remarkable property of glucosan is its power to form additive compounds. Heated with water it is transformed into glucose. It is dissolved by drydrochloric and hydrobromic acids with the evolution of heat, and on evaporation in vacuo, halogen bodies are derived, which are very probably a chlorglucose and bromglucose. When dissolved in methyl alcohol saturated with hydrochloric acid gas, glucosan is converted into a methylglucoside. These reactions distinguish glucosan from its isomer levoglucosan. From pure chemical reasoning, and without taking into account stereochemistry, the author gives glucosan the following constitution:



—Compt. rend., through Chem. News, 121 (1920), 107.

Glucose.—*Action of Hydrocyanic Acid on.*—Bougault and Perrier discuss the kinetics of the Kiliani reaction:

$$C_6H_{12}O_6 + HCN + 2H_2O = C_6H_{13}O_6COONH_4$$

in excess of cyanide and in excess of glucose. For details, the original paper should be read.—J. pharm. chim., 22 (1920), 129.

Glucose.—*Assay in the Presence of Lactose.*—E. Hildt finding that 10 mils of mixed Fehling's solution require for complete precipitation of the copper, 7.1 mils of 1 per cent. lactose solution before inversion and 5.1 mils of the same solution after inversion, has devised an assay method based upon these facts, using as hydrolyzing agents the catalyzer, sodium benzenesulphonate, sulphuric acid and a temperature of 95 to 98° during six hours. Having titrated the mixture with 10 mils of mixed Fehling's solution before inversion (n) and after inversion (n^1) the calculations necessary to determine the amounts of glucose and lactose are:

$$\text{Grammes of lactose in 100 mils of dilution} = \frac{3.55}{n^1} - \frac{3.55}{n}$$

$$\text{Grammes of glucose in 100 mils of dilution} = \frac{1.458}{n^1} + \frac{3.34}{n}$$

For the algebraic calculations whereby the above factors are obtained, the reader is referred to the original paper.—Compt. rend., Soc. Biol., through J. pharm. chim., 21 (1920), 136.

Glucose.—*Detection by Biochemical Synthesis.*—Bourquelot and Bridel utilize their method of glucosidal synthesis for the detection of dextrose in plants. An aqueous extract of the plant after removal of resinous matter with acetic ether is mixed with methyl alcohol and emulsin and the production of methyl-beta-glucoside observed by means of the polariscope.—J. pharm. chim., 22 (1920), 209.

Glycogen.—*Colorimetric Assay of.*—R. Thieulin points out that the assay of glycogen affords a useful method of determining the functionating of the liver and he has devised a simple colorimetric method of assaying glycogen solution, by utilizing the red-brown color that these solutions produce with iodine. He treats 2 mils of the unknown glycogen fluid with 2 drops of an iodine solution (1 gramme of iodine, 2 grammes of potassium iodide and 20 mils of

water) and compares it in test tubes with solutions of known strength of glycogen, to which the same iodine solution has been added.—J. pharm. chim., 21 (1920), 91.

Guloheptoses.—P. B. LaForge have prepared by condensation of glucose with hydrocyanic acid and by reduction of the resulting guloheptonic acids, the following:

Alpha-guloheptose; long needles melting at 185 to 187°; α_D = 65.65°.

Alpha-guloheptite; prisms melting at 138 to 141°; optically inactive.

Beta-guloheptose; in syrupy form only.

Beta-guloheptite; crystals melting at 129°; optically inactive.—J. pharm. chim., 22 (1920), 269.

Inulin.—*Relation to Fructose.*—Irvine reports that practically nothing is known about inulin, even its empirical formula is open to doubt, and in his opinion it is an octo-saccharide, with three hydroxy groups. On methylation in solution of caustic soda inulin yields dimethyl-inulin, and the author succeeded in obtaining timethyl-inulin, which can be distilled *in vacuo*. He also succeeded in obtaining 102 parts of crystalline methylglucoside from 100 parts of cellulose, a yield of 95 per cent. of sugar.—Chem. & Drug., 93 (1920), 1568.

Lactose.—*Hydrogenation of.*—J. B. Senderens finds that when hydro-alcoholic solutions of lactose are hydrogenated, with nickel used as the catalyst, two atoms of hydrogen are added to the molecule and a biose, *lactosite,* melting at 78° is obtained. Lactosite on treatment with diluted acids hydrolyzes to sorbit and galactose.—Compt. rend., through J. pharm. chim., 21 (1920), 328.

Lactose.—*Production from Whey.*—Experiments were made by H. E. Woodman on the possibility of improving the method of extraction of lactose from whey. In the German method the whey is nearly neutralized with caustic soda, evaporated *in vacuo* at 60 to 70° to a tenth of its volume, and allowed to cool. The sugar crystallizes out and is separated by the centrifuge. The mother liquid is boiled, the precipitated protein filtered off, and the filtrate

allowed to crystallize. A recovery of 75 per cent. of the sugar (3.85 per cent. on the whey) is obtained. By removing the protein by heating at 93° before evaporating, clarifying the filtrate with alumina cream, evaporating, and treating with charcoal and magnesium and calcium sulphates, a yield of 3.2 per cent. of lactose (on the whey) was obtained, containing 1.5 per cent each of protein and ash, a greater degree of purity than by other methods. It was found that an extremely small amount of iron was dissolved from the vacuum pan during evaporation.—J. Agric. Sci., through J. Soc. Chem. Ind., 39 (1920), 309A.

Lactose.—*Solubility in Water.*—The following results have been obtained by J. Gillis for the solubility of lactose in water at temperatures above 50° C. The figures represent percentage by weight of lactose ($C_{12}H_{22}O_{11}$) in the solution: 57.1° C., 34.9; 63.9°, 39.1; 73.5°, 45.8; 79.1°, 49.6; 87.2°, 55.1; 88.2°, 56.0; 107.0°, 63.9; 121.5°, 69.4; 133.6°, 73.2; 138.8°, 75.2; 158.8°, 81.1; 178.8° C., 86.7. —Rec. Trav. Chim., through J. Soc. Chem. Ind., 39 (1920), 829A.

Levulose Syrup.—*Possible Use in Pharmacy.*—J. J. Willaman states that a levulose syrup would be a distinct asset in the present commerce of sweet products. Levulose occurs in practically all fruits, is abundant in honey, and is found in appreciable amounts in sorghum syrup. But, according to Mr. Willaman, its most conspicuous occurrence in plants is in the form of inulin in the tubers of the Jerusalem artichoke and in the bulbs of the dahlia. Inulin is a polysaccharide somewhat resembling starch, but whereas starch yields glucose on hydrolysis with acid, as in the manufacture of corn syrup, inulin yields levulose. The inulin is present to the extent of 12 to 14 per cent. of the artichoke tuber, and as this plant gives very large yields to the acre, the possible yield of sugar from artichokes would compare very favorably with that of other sugar crops.

But the unknown factor in the proposition, according to the author, is the technology of manufacture. Practically nothing is known about the isolation of inulin and its hydrolysis to levulose on the commercial scale. Likewise the cost of production is unknown. If these problems could be solved—but they still await solution. It is argued that even if it did cost more, it is much sweeter than any

of the present sugars, that it would be worth considerably more, so that the greater cost would not necessarily be a handicap. Here, then, is a practical problem awaiting solution, the accomplishment of which brings in its train many possibilities of usefulness. Levulose syrup would probably not be used alone as a syrup, but would be employed for blending with other syrups to enhance their sweetness. In the manufacture of soft drinks and confections levulose could very largely replace sucrose, and thus increase the amount of the sugar that would be available as dry sugar.—Pharm. Era, 53 (1920), 320.

Malt Syrup.—*Manufacture and Uses.*—In discussing this syrup J. K. Dale states that the raw products necessary for its manufacture are corn and malt, although any starchy grains or tubers will do. The malt can be made from any grain, but barley is preferred. Malt is simply sprouted grain which has been kept moist and under favorable conditions. Malting increases the diastatic power. The corn can be treated in one of these different ways:

(a) Starch separated from grain as in manufacture of glucose.

(b) Corn freed from germ and ground to meal.

(c) Combination of A and B and known as wet milling process.

The starchy material of the corn is heated with water until it gelatinizes, the malt is added, the temperature kept uniform, a thin liquid containing maltose and dextrose results. The remainder of the manufacture consists of filtration, refining and evaporation.

Malt syrup is a clear, sweet, light-colored, pleasingly flavored syrup, whose composition runs about as follows:

Maltose, 64%; Dextrin, 15%; Moisture, 20%; Protein, 0.5%; Ash, 0.5%.

Malt sugar syrup accepts the flavors of other syrups very well. A blend consisting of equal parts of honey and maltose has been made with the result that there was very little noticeable difference from the unblended honey.—Pract. Drug. 39 (Oct. 1920) 25. (H. M.)

Mannitol.—*Oxidization by Nitrous Fumes.*—According to Votocek and Kranz, aqueous solutions of mannitol are slowly oxidized by nitrous fumes, yielding a mixture of mannose and levulose; reaction can be accelerated by the addition of small quantities of a ferrous salt. Nitrous fumes in this case behave like other

oxidizing agents, yielding a mixture of ketonic and aldehydic products.—Z. Zuckind, Böhm., through J. Soc. Chem. Ind., 39 (1920) 76 A.

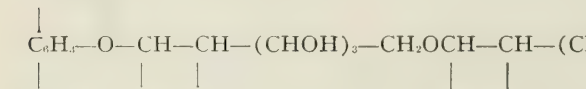
Mannobiose.—*Biochemical Synthesis of.*—Bourquelot and Hérissey report on an attempt to synthesize from mannose by aid of the enzyme, seminase, (Proc. Am. Pharm. Assoc., 1900, 852) a mannobiose. While not able to isolate this biose in crystalline form, the syrup obtained gave a crystalline phenylhydrazine derivative, that indicated the presence of a mannobiose with an optical activity greater than +20°.—J. pharm, chim., 21 (1920) 81.

Melizitose.—*Crystallography of.*—In an article supplementing the paper of Hudson and Sherwood (see page 347) E. T. Wherry gives the crystallographic reading of melizitose, as well as microdrawings of the crystals.—J. Am. Chem. Soc., 42 (1920) 125.

Melizitose.—*Poplar Leaves as Source of.*—G. Tanret reports that he made from 6 kilogrammes of [fresh?—Ed.] leaves of *Populus nigra* a syrup containing 55 grammes of solid matter of which 22 grammes consisted of melizitose.—Compt. Rend., through J. pharm. chim., 21 (1920) 206.

Primeverose.—*Constitution of.*—Continuing the work of Goris and Mascré (see YEAR BOOK, 1913, 176), C. Vischniac has studied primeverose, the biose obtained by the hydrolysis of *primeverine.*

Primeverose occurs in colorless crystals melting at 210°, soluble in water and alcohol and having the optical rotation 3° 43′ in fresh aqueous solution and after 24 hours 0° 34′. Upon hydrolysis with 2 per cent. sulphuric acid it is converted into glucose and xylose. Primeverose hydrolyzes to beta-methoxyresorcylic acid and primevose, hence Vischinac concludes that its formula is:



—Bull. Sci. Pharmacol., through Schweiz. Apoth. Ztg., 58 (1920) 332.

Saccharose.—*Speed of Diastasic Inversion of.*—Colin and Chaudun find that the speed of diastasic inversion is merely a question of fluidity (viscosity) of the inverting solution. The products of the hydrolysis, invert sugar, glucose and levulose, influence the speed merely through their viscosity, having no more influence than would the introduction of a neutral viscid substance, like glycerin. —Compt. rend., through J. pharm. chim., 21 (1920) 206.

Sugar.—*Alpha-Naphthol Test for.*—In testing for the presence of traces of sugar in the waters condensed from evaporators and pans by means of *a*-naphthol, the procedure involving underlaying with sulphuric acid is generally followed in the sugar factory. A more delicate and certain indication is stated by M. Kauffman to be obtained by the Skärblom modification, in which one or two drops only of the water under examination are mixed with about 0.2 mils of a 4 per cent alcoholic solution of *a*-naphthol and about 1 mil of concentrated sulphuric acid, and the whole shaken together. Whereas this modification was found to be capable of detecting 0.0005 gramme of sugar per liter, the method generally followed failed to show the presence of 0.015 gramme. It is said the delicacy of the underlaying method depends much upon the manner in which the sulphuric acid is added to the sugar solution. Thus, if the acid is added very slowly so as to minimize mixing, the ring may be hardly visible; whereas in the case of a solution of lower sugar content, if the test-tube be shaken a little after the addition of the acid a distinct color will be obtained.—Arch. Suikerind. Nederl. Indië, through J. Soc. Chem., Ind., 39 (1920) 580 A.

Sugar.—*Assay of.*—Van Leeuwen recommends adding to the sugar solution to be titrated with Fehling's solution four times its volume of 0.05 per cent. magnesium sulphate solution. The cuprous oxide settles very rapidly and the supernatant solution can easily be tested with copper with potassium ferrocyanide and acetic acid. For this purpose, however, the solution must first be cooled.—Chem. Weekbl., through Drug. Circ., 64 (1920) 102.

Sugar.—*Catalytic Action of Iron Oxide on.*—It is a well-known fact that when a lump of sugar is rubbed with tobacco ash the sugar can be ignited on the spot where it came in contact with the ash.

This phenomenon was ascribed to one or more catalytically acting substances in the ash. C. Thomae found that the action is produced by ferric oxide because sugar when rubbed with a dry rusty nail shows the same properties as that treated with tobacco ash.—Chem. Zeit. through Pharm. Weekbl. 57 (1920) 329. (H. E.)

Gaisser and Nolte object to the foregoing theory. The former thinks the phenomenon is due to the hygroscopic character of fresh tobacco ash because calcium chloride, freshly ignited sodium or potassium carbonate, phosphorus pentoxide, etc., produce the same effect. Nolte claims that since the ash is not pure and contains a number of salts, especially carbonates, that these produce the effect. —Chem. Zeit. through Pharm. Weekbl. 57 (1920) 357. (H. E.)

Sugar.—*Production from Nipa Palm.*—Consul Gunsaulis reports that the production of sugar from the sap of the nipa palm *(Nypa fruticans)*, a tropical plant growing over extensive areas, is commercially possible, as shown by laboratory experiments conducted at the Bureau of Science, Manila. At present the industry is still in an experimental stage, but from the experiments made it is estimated that there would be at least 12 per cent. of recoverable sugar in the sap, and the average annual yield of 4,000 gallons of sap per acre under management should produce about 4,000 pounds of sugar. The report continues:

"Although the production of sugar from nipa sap is still in the experimental stage, the manufacture of alcohol from the same source is a well-established industry. For many years the natives of the Philippines have been producing a low grade distillate averaging about 25 per cent. alcohol, which has been used as a beverage. Lately the crude stills which produced this distillate have largely been replaced by modern distilleries, seventy-five of which were in operation in 1913."—Drug. Circ., 64 (1920) 381.

Sugar.—*Production from Various Vegetable Sources.*—A. R. Ling describes at length the formation and methods of extraction of sugar from its various sources. The author as Chairman of the Empire Sugar Supply (Technical) Committee of the Society of Chemical Industry presents reasons for preferring the extension of planting of cane rather than beet in the British Empire and directs attention to the fact that sucrose obtained from beet has been found

unsuitable for use in the British brewing industries.—Chem. News, 120 (1920) 98 & 113. (J. H.)

Reducing Sugars.—*Volumetric Assay of.*—Jonescu and Vargolici proceed as follows: An aqueous solution containing 46 grammes of potassium ferricyanide and 46 grammes of potassium hydroxide per liter is made. The solution should be kept cool and in a dark place, when it will be found to be stable. Ten mils of this solution are diluted with 20 mils of water, heated to boiling and the sugar solution added until the liquid becomes decolorized. In colored liquids an addition of 10 drops of a 1 per cent. solution of picric acid are added as indicator, the end-reaction manifesting itself by the formation of red picramic acid. Ten mils of the standard ferricyanide solution require for complete reduction 10 mils of a 0.50 per cent. dextrose solution. For the determination of lactose in milk the following procedure obtains: Ten mils of milk are mixed with 10 mils of a reagent containing 20 grammes of glacial acetic acid and 10 grammes of picric acid to the liter and filtered. To 10 mils of the filtrate enough sodium hydroxide solution is added to neutralize and the volume made up to 40 mils. This liquid is now employed for the titration. Ten mils of the standard ferricyanide solution is the equivalent of 0.0676 gramme of lactose.—Bull. Soc. Chim., Romana, 2 (1920) 38. (G. C. D.)

Sugar Substitutes.—*Sweetening Value of.*—The relative sweetening power of sugar substitutes as compared with sugar has been determined by the U. S. Department of Agriculture to be:

Sugar	100
Honey (44° B.)	75
Corn sugar	45
Maltoso syrup (42° B.)	30
Corn syrup (45° B.)	20

—Am. Drug. 68 (Sept., 1920) 25.

Sugars.—*Iodometric Assay of.*—The polarimetric method is unreliable for the estimation of levulose in fruit juices. According to H. M. Judd, the iodometric methods of Colin and Liévin, and of Willstätter and Schudel for the determination of dextrose in

presence of levulose do not give accurate results, since only about 95 per cent. of the dextrose is oxidized, whilst the levulose is definitely attacked. It has been found, however, that a given weight of dextrose or levulose always reacts with a definite weight of iodine; in neither case is the amount affected by the presence of other sugars or by the concentration of the alkali, and the iodine equivalents of mixtures calculated from the constants agree with the observed values. Willstätter and Schudel's method may therefore be used for the analysis of mixtures of dextrose and levulose if the results be interpreted from the calculated iodine equivalents and the copper-reducing power of the mixture. The iodine equivalents of 1 gramme of each of the following sugars has been calculated: Dextrose, 1.315 grammes; levulose, 0.1028; mannose, 0.977; galactose, 1.418; arabinose, 1.702; rhamnose, 0.9243; lactose, 1.502; maltose, 0.7456 gramme. Sucrose is not oxidized by iodine under the conditions named.—Biochem. J., through J. Soc. Chem. Ind., 39 (1920).

Sugars.—*Those Used in Bacteriology.*—At the Chicago meeting of the American Chemical Society, E. H. Eitel discussed this topic, pointing out that the following rare sugars are now being produced commercially in this country:

l-Arabinose, dulcitol, *d*-galactose, *d*-glucose, glycogen, inositol, inulin, invert sugar, lactose, *d*-levulose from invert sugar, *d*-levulose from inulin, levulose sirupy, maltose, *d*-mannitol, *d*-mannose, melezitose, raffinose, rhamnose, sorbitol, sucrose, trehalose and *l*-xylose.

The paper discusses the bacteriological applications of these sugars.—J. Ind. Eng. Chem. 12 (1920) 1202.

Starch.—*Composition of.*—J. Mellanby finds that from a mucilage of starch, three types of amylo-granulose may be separated by treatment with colloidal iron solutions.

Type α is precipitated directly on addition of the iron solution. Yield about 80 per cent. of the starch employed.

Type β is precipitated when to the filtrate after removal of type α there is added an electrolyte that will precipitate both it and the iron.

Type δ remains in the liquid after filtration of the mixed precipitate of iron and type β.

Mellanby also studied the starch-iodine reaction and concludes that a molecule of starch is at least $(C_6H_{10}O_5)_{10}$ and that one such molecule unites with 1 atom of iodine. This combination will then take up a considerable amount of extra iodine, the quantity depending of the concentration of the solution employed. He finds that the separated α, β and δ types of amylose have different molecular formulæ, that of δ being $(C_6H_{10}O_5)_5$.—Biochem. J., through J. pharm. chim., 21 (1920) 38.

Starch.—*Phosphoric Acid Compound of.*—J. Kerb prepared an ester of starch with phosphoric acid by treating a soluble preparation with a solution of phosphorus oxychloride in chloroform in the presence of calcium carbonate. The calcium salt of the amylophosphoric acid was precipitated with alcohol from the concentrated solution and purified. By means of diastatic cleavage hexose monophosphoric acid was obtained from the compound in the form of a calcium salt. The latter substance was fermented by yeast.—Biochem. Zsch., through J. Soc. Chem. Ind., 39 (1920) 700 A.

Starches.—*Digestibility of Raw.*—It is generally assumed that raw starches are practically indigestible, but there is little evidence to support this view. Langworthy and Deuel have experimented on human beings with raw maize, wheat, and potato starches. The average amount of starch per man given daily was: maize starch, 241 grammes; potato starch, 194 grammes; wheat starch, 188 grammes, with a basal ration of oranges and sugar for three days. The starch was eaten as the constituent of an ice pudding, similar to ice cream. No trace of maize or wheat starch was detected in the feces, so that these raw starches are completely assimilated. Potato starch, however, is much less digestible; the amount found in the feces showed that an average of only 78.2 of the quantity ingested was assimilated. This starch also caused disagreeable digestive disturbances, such as excessive gas formation, cramp, and diarrhea. These symptoms did not occur with the other starches.—J. Biol. Chem., through Pharm. J., 105 (1920) 271.

ORGANIC ACIDS.

Organic Acids.—*Formation from Carbohydrates.*—Falck discusses the mechanics of the formation of organic acids from carbohydrates by the action of micro-organisms. He finds that there is in such acid formation a definite mathematical relationship between the external and internal factors of the reaction; that the internal factors are the acid formation capacity and the acid formation intensity; and that when these factors are definitely known by the operator, the technical production of acids from carbohydrates is greatly facilitated.—Pharm. Ztg. 65 (1920) 931.

Abietic Acid.—Abietic acid is reduced by hydrogen in presence of platinum black to dihydroabietic acid, $C_{20}H_{32}O_2$, m.pt. 173 to 178°, but this compound gives approximately the same Hübl-Waller and Winkler iodine values as the parent acid. Further, the values increase with the duration of the reaction, and similar relationships are shown by *d*-pimaric acid and its dihydro derivative. It is, therefore, suggested that the unreduced acids contain at least two non-equivalent double bonds, or that substitution by iodine also occurs. No derivatives of this type could, however, be isolated. D. Johansson considers the presence of an aromatic or hydroaromatic nucleus in the molecule of abietic acid to be now definitely established.—Arkiv. Kem. Min. Geol., through J. Soc. Chem. Ind., 39 (1920) 198 A.

Acetic Acid.—*Assay in Acetates.*—The method proposed by A. O. Pickett depends upon the more rapid vaporization of acetic acid in the presence of xylene than in the case of water vapor.

The sample is dissolved in small amount of water, a measured excess of 85 per cent. phosphoric acid added and 350 mils of xylene added and the mixture distilled from an electric hot plate.

The distillation is continued until only a film of xylene remains over the surface of the phosphoric acid, collecting the distillate in a large beaker. Titrate the distillate for total acidity and if chlorides are present in original sample, make correction for same by determining hydrochloric acid by means of silver nitrate titration and calculate organic acids as acetic acid.

The results obtained show accurate results on known samples and considerable reduction in time required to run assay.—J. Ind. Eng. Chem. 12 (1920) 570. (L. A. B.)

Acetic Acid.—*Testing for Sulphurous Acid in.*—Enz directs adding to a mixture of 5 mils of the acid and 95 mils of water, chlorine water and barium chloride. No turbidity, due to the formation of barium sulphate, should be produced.—Pharm. Zent., through Pract. Drug., 61 (Apr. 1920) 33.

Acetates.—*Detection in Mixtures.*—Curtman, Broggi and Fourman recommend the following method for detecting acetates in mixtures: The solution is acidified with nitric acid, treated with silver nitrate, and filtered. The filtrate is made just alkaline with caustic soda, a solution of barium and calcium chlorides added, and the precipitate filtered off. The clear liquor is concentrated to 5 mils after addition of hydrogen dioxide. After filtering off the deposited crystals the solution is made just neutral to phenolphthalein with dilute hydrochloric acid, 1 mil of ferric chloride solution is added, and the color compared with that of controls, prepared with 1 mil of ferric chloride solution in 5 mils of water and known quantities of sodium acetate. A reddish-yellow color is perceptible if as little as 2 mg. of acetic acid is present. Acetates may also be recognized by the odor of the vapor evolved on boiling 1 mil of the test solution with 2 mils of sulphuric acid (1:1). The test is sensitive to 2 mg., but nitrates seriously interfere.—Chem. News, through Pharm. Era, 53 (1920) 274.

Acetylsalicylic Acid.—*Detecting Free Acetic Acid in.*—A. N. Smith suggests the following test: One gramme of the sample is spread in a thin layer on the surface of a piece of muslin, fastened over the top of a funnel, having a diameter of 3½ inches. The stem of the funnel is made to pass through an opening in a ground-glass plate, and the whole covered with a bell jar. A tube connected with the top of the bell jar is in turn connected with a vessel containing previously boiled water, and this in turn with a water pump by means of which a current of pure air is aspirated through the apparatus. The air enters through the stem of the funnel, passes through the layer of acetylacetic acid and then through the water. Any free acetic acid will be taken up by the water and is then deter-

mined by the usual method of titration. Under these conditions any free salicylic acid will not volatilize.—Pharm. J., 105 (1920) 90. (G. C. D.)

Acetylsalicylic Acid.—*Effect of Crystallizing Solvent on.*—G. Cappeli finds that acetylsalicylic acid crystallized from chloroform melts at 134.2°; that crystallized out of acetonic solution by action of water, melts between 126° and 129°; that crystallized from benzol melts at 134.8°; and that crystallized from carbon tetrachloride melts at 134.5°. He prefers the last two solvents as crystallizing fluids, provided they are of high purity.—Chem. & Drug. 92 (1920) 1274.

Acetylsalicylic Acid.—*Masking the Presence of Free Salicylic Acid in.*—A. N. Smith finds that free salicylic acid in acetylsalicylic acid may be masked by the use of tartaric acid. When the ferric chloride test is applied some colorless non-ionized salt of iron is formed, there being no free Fe ions available for the formation of the violet-colored ferric salicylate. Certain other strong acids will produce the same phenomenon, particularly citric acid (1.0 per cent. of the latter being sufficient to mask the presence of about 0.2 per cent. of free salicylic acid). Tartaric acid, citric acid, etc., when present, can readily be detected after removal of the salicylic acid, acetyl-salicylic acid, etc., from a cold aqueous extract of the tablet, and, conversely, the free salicylic acid can be estimated colorimetrically after separation by means of some suitable solvent such as ether, chloroform, etc., which does not extract the masking substance; when either tartaric or citric acid is present, a mixture of equal parts of ether and petroleum ether is a better solvent than ether alone, since both acids are slightly soluble in ether. All samples of aspirin tablets, therefore, which, after being powdered, give no violet coloration with ferric chloride test solution, should be viewed with suspicion.—Analyst, through Pharm. J., 105 (1920) 510.

Acetylsalicylic Acid.—*Melting Point of.*—M. Auerbach reports upon the results of experiments with determinations of the melting point of acetylsalicylic acid. He finds that the melting point of this substance is lowered appreciably when the determination is carried out so that the temperature is increased by one degree only per minute. This is, no doubt, due to the decomposition of the acid

into acetic and salicylic acids. In one experiment, he heated at the rate of one degree per minute from 100° on and did not allow the temperature to go above 124°. The acid liquefied in 25 minutes. In another experiment, similarly conducted, but not heating over 115°, the acid liquefied in 45 minutes. He concludes that it is best to work as chemists usually do, namely, to heat just slowly enough so that changes in the appearance of the substance may be readily observed from degree to degree.—Pharm. Ztg. 65 (1920) 509. (C. P. W.)

Acetylsalicylic Acid.—*Non-Alcoholic Solvent for.*—Irwin A. Becker reports that pediatricians are prescribing acetylsalicylic acid in a solution of potassium citrate. The best proportion to insure complete solution is four of potassium citrate to one of acetylsalicylic acid. Syrup is sometimes added for the sake of palatability. Mr. Becker found that the ferric chloride test for salicylic acid was inhibited. Shaking out with an immiscible solvent gave a very small yield indicating that a reaction occurs between the alkaline salt and the acetylsalicylic acid.—J. Am. Pharm. Assoc. 9 (1920) 520. (Z. M. C.)

Acetylsalicylic Acid.—*Observations on.*—Of the samples tested by John H. Ramsay, Ph.C., only 27 per cent. were up to the B. P. standard. The results varied in free salicylic acid content, melting point and acetic odor.

The 5 grain tablets not only ranged in weight from 5 to 6.25 grains, but all gave an acetic odor and only two did not react with ferric chloride.

A discussion followed the reading before the North British Branch of the Pharmaceutical Society of Great Britain.—Pharm. J., 104 (1920) 7. (F. H.)

Acetylsalicylic Acid.—*Restriction of Sales in Argentina.*—The Argentine Health Department has decided to restrict the sale of aspirin except as prescribed by a physician. For another six months druggists will be permitted to continue the unrestricted sale of those brands of aspirin or of medicines containing aspirin that are already on the local market, but no new ones may be introduced. After the six months has expired the sale of the old brands will be prohibited

also, except on the requisition of an authorized practitioner.—Comm. Rept., through Pharm. Era, 53 (1920) 306.

Acetylsalicylic Acid.—*Toxicity of.*—An English physician reports: "Although several cases of aspirin poisoning have been noted, I think the following may be of interest owing to the small dose required to produce well-marked symptoms in an intolerant individual. Recently I saw a sailor, aged 25, who had taken half a tablet of aspirin—that is, 2½ grains. Within ten minutes he had severe headache, profuse sweating, and partial collapse. The face, arms, chest, back, and portions of the lower limbs were covered with an intense urticarial rash, which showed large raised patches as well as smaller aggregations of the eruption. The eyes were almost closed by an angio-neurotic edema of the lids. When he came to hospital, three hours later, the sweating and headache were still present, and the rash was well marked. No ill effects ensued, and the condition was corrected by a purge. The reason of the taking of the small dose was that three months previously he had taken a whole tablet—that is, 5 grains, and had had all the foregoing symptoms, but in a so much greater degree as to be alarming."—Brit. Med J., through Pharm. J., 105 (1920) 256.

Dr. E. Hearne reports that he was recently poisoned by a 10-grain dose of aspirin. He had taken similar doses both before and since without any harmful effect. The symptoms were as follows: In an hour the eyes became nearly closed, with edema of the lids and intense itching. The inner sides of the thighs and the flexor surfaces of the arms and legs were the chief sites of a rash, which appeared in large raised patches, and disappeared in a few hours. As curative treatment Dr. Hearne took a soda bath and a saline purge.—Brit. Med. J., through Chem. & Drug., 93 (1920) 1629.

Barbital (Veronal) Addiction.—The constant use of even small doses of barbital (veronal) affects the central nervous system. Those taking the drug habitually become much debilitated and seem less able to stand moderate doses. Death has occurred from a 3 gramme dose in addicts.—J. Am. Med. Assoc., 74 (1920) 544. (W. A. P.)

Veronal.—*A Typical Symptom of Poisoning by.*—C. Römer points out that in cases of veronal poisoning the pupils show a

typical narrowing.—Dtsch. Med. Wsch., through Pharm. Zent., 61 (1920) 579.

Luminal.—*Cannot be Detected in the Organism.*—Impens (1912) published an article in which he claimed that luminal can be detected in the organism in cases of forensic analysis. E. Nolte takes exception to this statement, having found that the hypnotic is completely destroyed in the body and that in persons who had taken as much as 4 grammes no trace of it could be isolated neither from the urine nor from the organs. This is the more surprising since veronal, which differs from luminal only in that one of its ethyl groups is replaced by a phenyl radical, can readily be detected.—Pharm. Zeit. 65 (1920) 320. (H. E.)

Luminal.—*Toxicity of.*—E. Hueber reports concerning a case of luminal poisoning, with fatal result. A male, aged 40 years, took 30 tablets, of 0.50 gramme each, during the course of several weeks, mornings and evenings only. The first symptom consisted of a skin eruption, with edema of the lips and eyelids, an inclination to sleep continuously and suppression of urine. The skin eruption subsided, but was followed by an annoying cough, accompanied with much expectoration. The patient later became violent and during a paroxysm death resulted. The drug had been given in the treatment of a case of epilepsy.—Münch. Med. Wsch., 66 (1920) 1090. (G. C. D.)

Luminal.—*Use in Epilepsy.*—J. Grinker calls attention to the value of luminal for the treatment of epilepsy. In small doses, from 1½ to 2 grains, once or twice daily, it has been found capable of preventing fits. Larger doses are seldom required, but may be given with safety. These larger doses may be given when commencing the treatment, especially after suddenly withdrawing bromide; but even in such cases the dose may be gradually reduced to 1½ to 2 grains. No harmful effects have thus far been observed from the long-continued administration of the drug, which does not appear to be habit-forming. The beneficial effect of luminal on the mentality of epileptic patients is surprising; they do not show, with average doses, the peculiar mental torpor of those under the influence of bromides. [See preceding abstract.—Ed.]—J. Am. Med. Assoc., through Pharm. J., 105 (1920) 323.

Benzoic Acid.—*Antiseptic and Physical Properties of.*—H. P. Kaufmann has determined the antiseptic properties of this acid and finds that it kills staphylococci in five hours in a dilution of 0.08 in 100 and is equally fatal to diphtheria bacteria in a dilution of 0.04 in 100. In the form of its aqueous vapor the acid is almost as strongly antiseptic as is phenol under the same conditions. Studying the rapidity of evaporation of the acid from aqueous solutions, Kaufman finds that from 1 per cent. solutions the first distillate contains 0.256 per cent of acid, whereas when 90 per cent. of the distillate has gone over, its benzoic acid percentage is 1.088. Distillation figures for 2.5 per cent. and 5 per cent. solutions are also given.—Z. angew, Chem., through J. pharm. chim., 21 (1920) 108.

Benzoic Acid.—*Manufacture of.*—V. Coblentz and H. W. Walker have secured letters patent (U. S. 1,332,028, February 24) on a process for the preparation of benzoic acid from toluene, which comprises stratifying toluene with between 20 and 43 per cent nitric acid at a temperature somewhat below the boiling point of toluene and allowing the acid and toluene to remain in contact until the reaction is substantially complete. Escaping vapors are condensed and returned to the materials undergoing reaction.—Pharm. Era, 53 (1920) 168.

Benzoic Acid.—*Sensitive Color Test.*—M. Guerbet recommends the following test which he finds responds with even 0.1 milligramme of benzoic acid or its derivatives:

The substance is placed on a watch glass, 3 to 4 drops of fuming nitric acid (sp. gr. 1.49) are added and the mixture evaporated to dryness on a water-bath. To the dry residue is added 1 drop of solution of stannous chloride and after warming a few minutes, 2 drops of 1 per cent. sodium nitrite are added. Then add 3 to 4 drops of 1 per cent. betanaphthol in 10 per cent. ammonia. A reddish-orange color is produced when benzoates are present and if the mixture is evaporated to dryness on a water-bath and 1 mil of concentrated sulphuric acid is added, the acid becomes reddish-violet.

This reaction is due to the formation of betanaphtholazobenzoic acid and can be applied to benzoic, hippuric and cinnamic acids and

to cocaine, stovaine and other benzoyl alkaloids.—J. pharm. chim., 22 (1920) 321.

Benzoic Acid.—*Use as Disinfectant.*—H. P. Kaufmann recommends the vaporization of benzoic acid for room disinfection and for inhalation after diphtheria. He finds that when so used benzoic acid has marked bactericidal properties.—Z. angew. Chem., through Pharm. Zent. 61 (1920) 90.

Benzoic Acid.—*Volatility of.*—N. V. Sidgwick determined the volatility in steam of benzoic acid and some of its derivatives by passing steam through a mixture of the acid and water contained in two 120 mil flasks heated in a glycerin bath and arranged in series with one another and with a Kjeldahl trap leading to the condenser. The steam connections, the upper parts of the flasks, and the trap were all lagged to prevent condensation. The following are some of the results:

	Percentage in distillate.	Vapor pressure in mm.×100.	Relative vap. pressure.
Benzoic acid	1.006	112.9	1.0
Phenylacetic acid	0.294	29.55	0.262
Toluic acid—ortho	0.964	97.0	4.49
—meta	0.604	60.7	2.81
—para	0.215	21.6	1.0
Hydroxybenzoic acid—ortho	0.400	39.7	1320.0
—meta	0.0015	0.149	5.0
—para	0.0003	0.030	1.0

The relative vapor pressure above is referred to the *para*-acid as unity, except that phenylacetic acid is referred to benzoic acid.—Chem. Soc. Trans., through J. Soc. Chem. Ind., 39 (1920) 466 A.

Saccharin.—*Assay of.*—O. Beyer reports that the formula $x=2.01329\times c-100/0.09845$ may be used to calculate the percentage (x) of *o*-benzoicsulphimide in commercial saccharin when 1 gramme of the sample is titrated with $N/10$ potassium hydroxide solution using phenolphthalein as indicator; c is the number of mils of the alkali solution used.—Chem. Ztg., through J. Soc. Chem. Ind., 39 (1920) 526 A.

Saccharin.—*Color Test for.*—L. Thevenon finds that the imide group of the saccharin molecule can be easily diazotized and that the resultant product combines with betanaphthol with the formation of a red color. He dissolves 0.1 gramme of sodium nitrite in 100 mils of water and to 10 mils of the solution he adds 6 drops of 30 per cent sulphuric acid and 0.1 gramme of saccharin dissolved in 25 mils of water. After letting the mixture stand for a few minutes, 0.1 gramme of betanaphthol is added, when a brilliant red color is produced.—J. pharm. chim., 22 (1920) 421.

Saccharin.—*Prosecution for Sale of.*—The government brought suit against the Monsanto Chemical Works charging them with violation of the pure food law, in their rather extensive sales of saccharin, taking the position that its employment is deleterious to health. The government failed to prove its contention and the jury disagreed.—Bull. Pharm. 34 (1920), 45. (C. M. S.)

Saccharin.—*Separation from Benzoic Acid.*—Saccharin and benzoic acid are extracted together from foods, etc., by most of the methods employed for the determination of benzoic acid, but the two substances may be separated, according to E. Schowalter, from one another by means of carbon tetrachloride, in which saccharin is practically insoluble. The ethereal solution obtained as in von der Heide's method for the determination of benzoic acid is evaporated at a low temperature, the residue dried in a vacuum desiccator to remove the last traces of acetic acid, and then treated with carbon tetrachloride. The benzoic acid dissolves and may be titrated. The insoluble residue of saccharin may be identified as such by the usual reactions. Saccharin cannot be separated from benzoic acid by sublimation, since both begin to sublime at about 120°. Attention is directed to the fact that saccharin, in its anhydride and sodium salt, benzoic acid and soluble benzoates are all absorbed to a considerable extent by animal charcoal from their aqueous solutions.—J. Soc. Chem. Ind., 39 (1920), 134A.

Saccharin.—*Truth About.*—It has been asserted that ingestion of saccharin increases the catalase content of the blood; that catalase increases oxidation in the animal organism, and hence that the use of saccharin by diabetics might be of value. However, the alleged

content of catalase remains improbable and unproved. Further, recent investigations show that administration of saccharin, even in huge amounts, does not increase oxidation in the animal body. Saccharin is neither a food nor a potent drug. Its usefulness in dietotherapy is limited to the function of taste.—J. Am. Med. Assoc., 75 (1920), 1347.

Sweetening Agents.—*Examination of.*—After citing numerous instances of the adulteration of saccharin in Germany during the last few years. W. Olszewski discusses various suggested methods of examination of this sweetener as well as of dulcin, giving a bibliography of 17 titles.—Pharm. Zent., 61 (1920), 583.

Benzoyl Peroxide.—Vanino and Herzer give a detailed account of the manufacture, properties and chemistry of benzoyl peroxide. They report that it is used for bleaching oils, such as peanut oil, mustard oil, sesame oil, etc., for which purpose only very small quantities (0.1 to 0.2 per cent.) are necessary; further as an antiseptic and for dressing wounds. For estimating benzoyl peroxide 0.2 to 0.3 gramme of the substance is dissolved in 10 to 15 mils of alcohol, applying a gentle heat, then an excess of about 10 per cent. potassium iodide solution is added, the mixture is acidulated, heated on a water bath for 4 minutes and, after allowing the liquid to stand for 30 minutes, the liberated iodine is titrated with N/10 sodium thiosulphate solution. Each mil of thiosulphate solution consumed corresponds to 0.0121 gramme of benzoyl peroxide.—Arch. Pharm., through Drug Circ., 64 (1920), 257.

Benzyl Esters.—*Preparation from Benzyl Chloride.*—Gomberg and Buchler, noting the facility with which carbon tetrachloride, benzotrichloride and benzophenone chloride can be made to condense with various derivatives of the aromatic series, with or even without the aid of catalysts, concluded that benzyl chloride also might be brought into a wider number of direct combinations than has been done hitherto.

This conclusion has been shown to be correct, as the work of the authors shows that benzyl chloride, heated with the dry salts of various organic acids in the presence of copper as a catalyst, gives fair yield of the corresponding esters. Some benzyl chloride is lost through decomposition under the influence of the catalyst.

The benzyl esters may be obtained in purer state and in better yields up to 85 per cent. when benzyl chloride and aqueous solutions of the salts of the corresponding acids are heated and thoroughly stirred at the same time. The paper also indicates the conditions of procedure likely to prove most serviceable in the hydrolysis of benzyl chloride to benzyl alcohol.—J. Am. Chem. Soc., 42 (1920), 2059. (J. L. M.)

Benzyl Benzoate.—*Palatable Administration of.*—Hirschfelder overcomes the bitter burning taste of benzyl benzoate by use of the following mixture: Pure benzyl benzoate, 10; emulsion [?] of acacia, 5; aromatic elixir of yerba santa, 35. Dose, one teaspoonful. This mixture has been found of value as an antispasmodic in cardio-spasm, pain in gastric ulcer, bronchial asthma, and in dysmenorrhea.—Minn. Med., through Am. J. Pharm., 92 (1920), 834.

Benzyl Benzoate.—*Therapeutics of.*—The chemical properties of benzyl benzoate have been known for years. Its therapeutic properties as an antispasmodic have been known only a short time. Before this new addition to our materia medica can be given thorough clinical trial, it is necessary that the products be of a quality sufficiently pure for medicinal use. For the physician's protection, as well as for an aid to the manufacturer, the A. M. A. Chemical Laboratory, at the request of the Council on Pharmacy and Chemistry, has elaborated purity standards. It has also examined the market supply and found that, on the whole, the nonproprietary medicinal brands are of a satisfactory grade for clinical use.—J. Am. Med. Assoc., 75 (1920), 335. (W. A. P.)

Benzyl Benzoate.—*Use in Arterial Hypotension.*—D. I. Macht points out that benzyl benzoate is a powerful vasodilator without being depressant to the heart when administered in small doses. It is, therefore, effective in the treatment of hypertension and in angina pectoris. It is given in the form of a 1:5 alcoholic solution, diluted with water, the ordinary doses being 20 to 30 drops of such solution taken three or four times a day. After the desired therapeutic effect is obtained by administering full doses, the reduced pressure may be maintained by keeping the patient on a very small dose of the drug, sometimes no more than 5 minims of the 1.5 solution being neces-

sary. The effect of benzyl benzoate was demonstrable even in cases in which nitrites failed to produce vasodilatation.—N. Y. Med. J., through Pharm J., 105 (1920), 379.

Benzyl Benzoate.—*Use in Hiccough.*—D. I. Macht finds benzyl benzoate useful in the treatment of persistent hiccough. Three cases are recorded which were eased by the drug in a very short time, all of which has resisted ordinary treatment. One case was cured by the administration of one dose of 25 drops of a 20 per cent. solution in alcohol, equivalent to 5 minims of benzyl benzoate. It is suggested that the drug should prove of diagnostic value in differentiating hiccough of purely central origin from that of peripheral origin. As the chief effect is on smooth muscle it should prove useful for the relief of the latter. Benzyl benzoate is best administered in the form originally suggested by the author, namely, a 20 per cent. solution in alcohol. Of this solution the patient takes 20 to 40 minims in water or milk. It is neither convenient nor advantageous to give the drug in suspension in syrups or elixirs; and the administration in capsules has produced irritation in some cases and rendered the therapeutic action too slow in others. To children the solution can be conveniently given in sugar, water or milk.—Med. Rec., through Pharm. J., 105 (1920), 271.

Benzyl Benzoate.—*Use in Whooping Cough.*—Although Dr. D. I. Macht finds that benzyl benzoate exerts no direct curative action on whooping cough, and has no influence on the duration of the disease, it has proved to be a most valuable palliative, lessening the frequency and violence of the paroxysms of coughing. When used in the Johns Hopkins Hospital, it was found that 90 per cent. of the cases of whooping cough treated with benzyl benzoate showed more or less beneficial results, and 50 per cent. marked improvement. Many of the patients who responded favorably to the drug had been treated previously with bromides, antipyrine, quinine, belladonna, paregoric, and even with heroine. In many cases the relief was so marked that parents came begging for more of the drug. The drug was given in the form of a 20 per cent. alcoholic solution, from 5 to 40 drops of which was administered in water, milk, or on sugar, three or four times a day. It was flavored with 1 to 5 per cent.

of benzaldehyde, and it was soon noticed that this addition greatly increased the efficacy of the treatment.—Lancet, through Pharm. J., 105 (1920), 323.

Sodium Cacodylate.—*Use in Lung Troubles.*—After an experimental study of the various pulmonary remedies, such as volatile oil, terpenes, creosote preparations and sodium cacodylate, Ries and Ries-Imchanitzky found the latter best adapted for complaints of that character. They employ the remedy in hypodermic injections of 5 per cent. solution, giving 0.2 gramme during 24 hours The authors note that injections of the cacodylate brings within a minute the garlic-like odor of arsenical compounds to the respired breath. This, they think, indicates the immediate action of the cacodylate upon the living tissue.—Corres-Bl. Schweiz. Aertze, through Pharm. Zent., 61 (1920), 518.

Chelidonic Acid.—*Occurrence in Plants.*—In purifying a maceration of lily of the valley leaves by means of lead acetate, J. Dedek obtained after removing the lead, a white, crystallized water-soluble acid which later on was identified by E. Stransky as chelidonic acid and which was identical with the acid isolated in 1839 by Probst from celandine. Later, the acid was found in white hellebore and in the root of *Buphane disticha.* It was further found that the acid when boiled with milk of lime is split up into one molecule of acetone and two molecules of oxalic acid. Since oxalic acid is so easily split off from chelidonic acid and occurs so frequently in the vegetable kingdom, Stransky examined 33 plants for chelidonic acid and especially those which are rich in oxalic acid. The quantitative analysis was based on the iodometric estimation of the acetone, which as already mentioned, is formed when chelidonic acid is heated with milk of lime. Thus he found in lily of the valley leaves 2.09 to 2.18 per cent.; in the seeds of *Sabadilla officinarum* 1.42 and 1.53 per cent.; in the herb of celandine from 0.14 to 0.74 per cent.; *Veratrum viride* contains 0.31 to 0.39 per cent.; very small amounts of the acid were found in *Veratrum album,* colchicum root, sarsaparilla, etc. The figures given are calculated for the dry drugs. —Arch. Pharm., through Pharm. Weekbl., 57 (1920), 772. (H. E.)

Cinnamic Acid.—*Detection of.*—Traces of cinnamic acid can be detected with the aid of a ferric salt and hydrogen dioxide, accord-

ing to G. Denigès. To each 2 mils of the solution of cinnamic acid or cinnamates one drop of ferric chloride solution is added, the liquid is boiled and then one drop of hydrogen dioxide solution is added. If no odor of benzaldehyde has been developed, the boiling is repeated. By this method as little as 20 mgms. of cinnamic acid in one liter can be detected. If more than 100 mgms. is present in one liter of the liquid under examination, the amount of ferric chloride solution and of hydrogen dioxide solution should be increased. Cinnamic acid esters should first be saponified with caustic soda solution and the liquid should then be acidified before subjecting it to the test, which can also be applied to Peru balsam and tolu balsam.—Bull. Soc. Pharm., Bordeaux, through Pharm. Weekbl., 57 (1920), 404. (H. E.)

Cresylic Acid.—*Analysis and Composition of.*—Fox and Barker in a communication discuss various methods whereby the proportion of the three cresols in cresylic acid can be determined in a comparatively ready manner. They restrict the term "cresylic acid" to tar acids distilling up to 210° and redistilled to 204°. The methods employed, and results obtained are described in some detail.—J. Soc. Chem. Ind., 39 (1920), 169T.

Cyanic Acid.—*Microchemical Detection of.*—R. Fosse reports that when cyanic acid is precipitated as silver cyanate, it may be detected by either one of the following three ways: (a) Definite and characteristic microscopic crystals are obtained if the silver cyanate is crystallized from hot water. (b) When silver cyanate, cobalt acetate and potassium chloride are intimately mixed by trituration, potassium cobalticyanate, blue in color, results. This color is destroyed upon addition of water, and restored by alcohol.

The potassium cobalticyanate is readily differentiated from the sulphocobalticyanate, as the latter is colored upon addition of any alcohol or ferric chloride and diluted acids destroy it. (c) When silver cyanate is triturated intimately with hydroxylamine hydrochloride, and the mixture treated with a drop of diluted ferric chloride solution, a bluish violet is produced.—Compt. rend., 171 (1920), 722. (G. C. D.)

Glycerophosphates.—*Detecting Inorganic Phosphates in.*—J. Lizius treats 0.10 gramme of a glycerophosphate with 10 mils of

diluted nitric acid, and 10 mils of a 10 per cent. solution of ammonium molybdate. A turbidity results, if the sample contains 0.10 per cent. or more of inorganic phosphate. A more sensitive reagent is that of Scott and Plimmer, and is prepared by adding 80 mils of 10 per cent solution of ammonium molybdate to 12 mils of hydrochloric acid, sp. gr. 1.160, and then introducing successively 20 grammes of ammonium chloride and 10 mils of a saturated solution of potassium persulphate. Five mils of the reagent are mixed with 0.10 gramme of the salt to be tested. If inorganic phosphate be present in amounts of 0.001 per cent. or more, a decided turbidity will manifest itself within a few minutes. The author claims that the U. S. P. test is not reliable, perhaps because of the fact that an excess of ammonium molybdate is not employed.—Pharm. J., 105 (1920), 100. (G. C. D.)

Hydrocyanic Acid.—*Determination of.*—R. Leitch Morris, enumerates various volumetric processes for the determination of cyanides criticising each in turn. The author's experiment in the same field conclude the article.—Pharm. J., 105 (1920), 83. (F. H.)

Hydrocyanic Acid.—*Disinfection with.*—This substance in gaseous form is used as a moth destroyer with satisfactory results. To determine the risk of poisoning when rooms are so treated, H. Fühner carried out a disinfection experiment in a sealed room containing upholstered furniture, cushions, clothes, etc., 670 grammes of hydrocyanic acid (from sodium cyanide and sulphuric acid) being liberated in the 42.5 cubic meters of room space. After 15 hours the room was well ventilated. All moths, flies, etc., in the room were killed, as were also mice and ants placed in cages in the room. All the poison was removed by 10 hours' ventilation, except in the case of the cushions, which retained some of the gas for a considerable time longer.—Pharm. Zent., through J. Soc. Chem. Ind., 39 (1920), 79A.

Hydrocyanic Acid.—*Transformation into Thiocyanic Acid in the Cadaver.*—Chelle finds that, contrary to the general opinion, hydrocyanic acid does not disappear from the putrefying cadaver, but that it is converted into the relatively stable thiocyanates. He recovers it from the cadaver by adding to a sample enough acid

to liberate thiocyanic acid, running through the mixture a current of air, passing the air containing the thiocyanic acid into decinormal potassium hydroxide. The potassium thiocyanate thus recovered is converted by chromic mixture into hydrocyanic acid, which is blown over with air into the appropriate solvent and assayed. Chelle finds the best assay is that of Denigès (titration with silver nitrate V. S. in ammoniacal solution, using potassium iodide as indicator).—Compt. rend., through J. pharm. chim., 21 (1920), 318.

Lactic Acid.—*Assay by Oxidization.*—O. Schüppli approves of Szeberenyi's assay of lactic acid, based upon the fact that that acid upon oxidization with chromic acid oxidizes to acetic acid; whereas malic, tartaric and oxalic acids oxidize under the same conditions, directly to carbon dioxide. Schüppli finds that 97 per cent. of the lactic acid present oxidizes to acetic acid; only 3 per cent. oxidizing directly to carbon dioxide. He finds, however, that in the case of wine, the sugar and other organic matter present affect results.—Trav. Chim. Aliment. Suisse, through Am. J. Pharm., 92 (1920), 56.

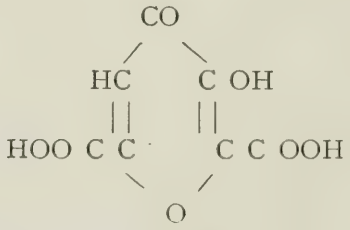
Lactic Acid.—*Use in Food Products.*—George Defren discusses edible refined lactic acid which is now largely used in low-alcohol beers; in "soft" drinks (where 1¾ pounds of 50 per cent. acid replace 1 pound of citric acid and 1½ pounds replace 1 pound of tartaric acid); in the baking industry; in the candy industry, and in the production of jellies. An acid calcium lactate is also being produced for use in baking powders.—Chem. Age., through Merck's Rept., 29 (1920), 146.

Levulinic Acid.—*Assay of.*—Soap tablets and soap extracts are obtained by hydrolyzing substances which are rich in albumin such as casein, yeast, etc., with hydrochloric acid. As by-products obtained by the action of these acids on the carbohydrates which accompany the albuminoidal substances, formic acid and especially levulinic acid are produced. L. Grünhut made experiments in order to determine the latter acid quantitatively and for this purpose he subjected the acid to the action of chromic acid in the presence of a sufficient amount of sulphuric acid by which the acid is decom-

posed into acetic acid, carbonic acid and water. Thus the levulinic acid could be estimated either from the amount of chromic acid consumed, or by distilling the acetic acid and titrating the distillate. When acetic acid and lactic acid are present besides formic acid and levulinic acid, these four acids can be extracted with ether. The volatile acids can then be separated from the non-volatile acids by distillation, and in this manner the four acids can be estimated indirectly. Grünhut further points out that lactic acid is not volatile with steam, but that the lactic anhydrides, which are always present in the commercial acid, are volatile with steam.—Chem. Ztg., through Pharm. Weekbl., 57 (1920), 621. (H. E.)

Maleic Acid.—*Production from Benzene.*—Weiss and Downs describe the method whereby they have oxidized benzene to maleic acid. Their apparatus consists essentially of (a) a vaporizer, in which benzene is kept at an exact temperature through which is passed a stream of air heated to the same temperature; (b) a U-tube containing the catalyst (molydbenum or vanadium) immersed in a regulated metal bath; (c) absorbers, water to remove the maleic acid and ice-cooled receivers and oil scrubbers to remove the unchanged benzene. From the maleic acid thus obtained, the fruit acids, particularly citric and tartaric, will eventually be manufactured on a commercial scale.—J. Ind. Eng. Chem., 12 (1920), 228.

Meconic Acid.—*Structure of.*—At the 1920 meeting of the German Naturalists and Physicians, Thoms and Pietrulla reported their work on the structure of meconic acid. While all of the difficulties were not cleared up, the authors incline to the formula suggested by Peratoner in 1897, viz.:



—Pharm. Ztg., 65 (1920), 753.

Sodium Morrhuate.—*Use in Leprosy.*—From results obtained by E. Muir in the treatment of three hundred cases of leprosy it is found that sodium morrhuate in nodular leprosy is not, in any respect, less efficacious than sodium hydnocarpate, and it has the advantage that it may be injected directly into the nodules, where it acts locally on the bacilli, causing first a swelling then a shrinking of the nodule. Of the general leprosy patients treated with hydnocarpate, there was temporary improvement in 132, much improvement in 58 cases, and in several the lesions disappeared entirely. Generally sodium hydnocarpate gives better results than morrhuate in anesthetic cases, but the vein soon become blocked, and sodium morrhuate has to be used, as it can be employed hypodermically and intramuscularly; whereas the hydnocarpate is only given intravenously. The dosage of each salt varied from 0.5 to 5 mils of a 3:100 solution beginning with the smaller dose.—Ind. Med. Gaz., through Pharm J., 105 (1920), 220.

Oxalic Acid and Oxalates.—*Action of Heat on.*—G. Calcagni reports that hydrated oxalic acid melts at 98° and yields carbon monoxide and dioxide in unequal volumes at 110° to 120°. The anhydrous compound, obtained by protracted storage of the hydrated acid in a vacuum over sulphuric acid, begins to turn pasty and to decompose at 135°, complete fusion and vigorous decomposition and distillation occurring at 160°. Among the products of the thermal decomposition of ammonium oxalate are carbon monoxide and dioxide, ammonium carbonate, and apparently oxaminic acid. Sodium (or potassium) hydrogen oxalate yields more carbon monoxide than corresponds with the equations: $2NaHC_2O_4 = Na_2C_2O_4 + CO_2 + CO + H_2O$ and $Na_2C_2O_4 = Na_2CO_3 + CO$, while formic acid is also formed and the residue contains carbon. Normal potassium oxalate yields at first water and carbon monoxide and dioxide, possibly owing to contamination with the acid salt; later only carbon monoxide is evolved, leaving the carbonate and carbon. Calcium oxalate gives carbon monoxide as sole gaseous product, while the residue contains calcium carbonate and carbon and, as it reduces silver nitrate solution, probably the formate as well. Barium and strontium oxalates behave similarly to the calcium salt, whilst magnesium oxalate decomposes directly into carbon

monoxide and dioxide and magnesia.—Gazz. Chim. Ital., through J. Soc. Chem. Ind., 39 (1920), 501A.

Oxalic Acid.—*Color Test for.*—Lewis H. Chernoff, gives the following color test for oxalic acid.

A few crystals of resorcinol are added to about 5 mils of the unknown solution in a test-tube and the mixture is warmed slightly to dissolve the resorcinol. It is then cooled and 5 mils of concentrated sulphuric acid are carefully and slowly poured in along the side of the tube so as to form a layer. A blue ring will be formed at the junction of the two layers, if oxalic acid is present. The color is best seen if held to the light in front of a sheet of white paper. Care must be taken that the mixture does not warm up appreciably. If the blue color does not appear in a few minutes, the mixture is shaken thoroughly and, after cooling somewhat another 5 mils of sulphuric acid are added. Should the color still fail to appear the mixed contents of the tube should be gently warmed over a flame (not boiled) when an indigo blue color will diffuse throughout the liquid. If the mixture be cooled with ice-water, the color will disappear, only to reappear again on heating. If the mixture be boiled a few minutes the color will turn a deep dark green, which will become a light yellow-green on cooling. If to the cold yellow-green solution an equal volume of sulphuric acid be added so as to form two layers, the blue color will again appear. It is believed that all these reactions taken together are characteristic of oxalic acid alone.

This test may be made sensitive to one milligramme if the dry unknown substance be warmed with two drops of a 10 per cent. aqueous resorcinol solution and the sulphuric acid be added drop by drop. The blue color then appears immediately. For very dilute solutions of oxalic acid or its salts, it is best to evaporate to a concentration of about 10 per cent.—J. Am. Chem. Soc., 42 (1920), 1784. (J. L. M.)

Oxalates.—*Color Reaction of.*—Macri points out that the Caron-Raquet reaction (See YEAR BOOK, 1919, 368) was published by the author in 1917 as a test for manganese salts. Use of an oxidizing agent is unnecessary, since agitation of a hot solution of a manganese salt with a little alkali causes absorption of atmospheric

oxygen and formation of higher oxides of manganese, these giving the red coloration with an oxalate. The reaction is not given in acid solution.—Boll. Chim. Farm., through J. Soc. Chem. Ind., 39 (1920), 384A.

Oxalic, Lactic and Tartaric Acids.—*Detection of.*—Brauer finds that when oxalic acid is heated with concentrated sulphuric acid and resorcinol a beautiful violet color is produced, while lactic acid and tartaric acid when treated in the same way, give a red color. When diluted sulphuric acid (1:1) or a still weaker acid is used in the test, a red color is produced with lactic acid, a green color with oxalic acid and a yellow color with tartaric acid. The test, therefore, can be used for distinguishing these acids from each other.—Chem. Ztg., through Drug. Circ., 64 (1920), 420.

Mercuric Oxycyanide.—According to A. J. Jones it is hard to find a commercial sample of this salt which is pure, they being as a rule a mixture of cyanide and oxycyanide. He gives the following method of preparation for the pure salt.

Forty grammes of mercuric cyanide and 30 grammes of yellow mercuric oxide are mixed in a mortar and then ground in to smooth cream with 15 mils of water; continue trituration until a magma results then add 5 mils of 20 per cent. solution of caustic soda; continue adding water from time to time until the paste is white. Set aside over night, dilute with 200 mils of water and render acid to phenolphthalein with acetic acid. Transfer to a flask with 700 mils of boiling water containing 20 grammes of mercuric cyanide in solution. Heat until solution is complete and set aside to crystallize. Dry salt on filter.

Some authorities state that this salt decomposes at 80°, but this is not true, especially in a dilute solution of 1 to 25. Experiments show that different salts according to their purity decompose and explode from 160° to 200°. The oxycyanide itself begins to decompose at 160° but the presence of normal cyanide retards the velocity of the reaction.—Pharm. J., 105 (1920), 86. (J. M. W.)

Phytic Acid.—*Synthesis of.*—R. J. Anderson states that the product obtained by interaction of inositol, phosphoric acid, and phosphorus pentoxide appears to be an inositoltetra-phosphoric acid,

and is not identical with natural phytic acid or inositol-hexaphosphoric acid.—J. Biol. Chem., through J. Soc. Chem. Ind., 39 (1920), 673A.

Picric Acid.—*Use as a Disinfectant.*—A five per cent. solution of picric acid is recommended by Cassegrain as a preoperative disinfectant. He finds that it thoroughly disinfects and can be used with soap and water, and that it does not irritate the skin, and is approximately 40 per cent. cheaper than iodine.—Am. J. Pharm., 92 (1920), 138. (J. K. T.)

Resin Acids.—*Relation to Retene.*—Retene is converted by sodium and boiling amyl alcohol into dihydroretene, m. p. 98.5°, b. p. 208° to 210° at 10 mm., and tetrahydroretene, yellowish oil, b. p. 180° to 183° at 10 mm., sp. gr. 1.0057 at 10°/4° n^{20}_D=1.56061. Fuming hydriodic acid (sp. gr. 1.96) and red phosphorus transform retene into hexahydroretene b. p. 175° to 177° at 10 mm., sp. gr. 0.9802 at 20°/4°, n^{20}_D=1.54705, octahydroretene, b. p. 163° to 165° at 10 mm., sp. gr. 0.9578 at 20°/4°, n^{20}_D=1.53023, dekahydroretene, b. p. 155° to 158° at 10 mm., sp. gr. 0.9342 at 20°/4° n^{20}_D=1.51501, and dodekahydroretene, b. p. 148° to 150° at 10 mm., sp. gr. 0.8985 at 20°/4°, n^{20}_D=1.48510. A. J. Virtanen expresses the view that all resin acids having the formula $C_{20}H_{30}O_2$ contain in their molecule a hydrogenized retene nucleus.—Ber., through J. Soc. Chem. Ind., 39 (1920) 792A.

Salicylic Acid.—*Incompatible Prescription Containing.*—G. S. Kitchin states that the following prescription was dispensed recently and presented no unusual features:

Acid salicyl	dr. 1½
Zinc ox	drs. 4
Calamin	dr. 1½
Glycer.	drs. 4
Aq. ad.	oz. 8

On standing, the insoluble sediment occupied about one-fourth of the capacity of the bottle and could easily be shaken up so as to make a thin creamy lotion. It was sent out with a "Shake-the-bottle"

label. At the end of four days it had set to a gelatinous-looking magma, completely filling the bottle, and so solid that the bottle could be inverted without any of the contents coming out. On experiment, it was observed that this change does not apparently begin to take place till after two or three days. Once the process has started, however, it proceeds with considerable rapidity. Experiments showed that the result appeared to be due to a reaction between the salicylic acid and the zinc oxide. The general character of the reaction may be indicated by the following equations. There is first formed neutral zinc salicylate:

$$ZnO + 2(C_6H_4.OH.COOH) = Zn(C_6H_4.CH.COO)_2 + H_2O.$$

The neutral zinc salicylate reacting with excess of zinc oxide in presence of water results in the formation of basic zinc hydroxysalicylate:

$$Zn(C_6H_4.OH.COO)_2 + ZnO + 2H_2O = 2ZnOH(C_6H_4.OH.COO) + H_2O.$$

The formula of basic zinc hydroxysalicylate may be written $ZnOH(C_6H_4.OH.COO)H_2O$. It is well known that neutral zinc salts in aqueous solution, in presence of excess of zinc oxide, form a series of basic salts depending on the conditions and relative proportions of neutral salt and oxide. Quite probably the very bulky magma consists of a more highly basic hydroxysalicylate than the equation indicates. This incompatibility is important also from the fact that the prescriber believes he will have the full antiseptic effect of free salicylic acid. After consultation with the prescriber, the quantity of salicylic acid was reduced from 90 grains to 40 grains, and one fluid ounce of rectified spirit was added. This gave a satisfactory lotion.—Chem. & Drug., 92 (1920), 420.

Salicylic Acid.—*Melting Point of.*—W. J. Bush & Co. reports that pure salicylic acid has melting point approximately 159° and products of melting point 158° to 159° C. are regularly obtained in current British manufacture.—Perf. Ess. Oil Rec., through J. Soc. Chem. Ind., 39 (1920), 526A.

Sodium Salicylate.—*Assay of.*—Inasmuch as the U. S. P. method of assay of organic salts requires such careful manipulation and is so time-consuming, H. W. Jones makes use of Koppeschaar's solution with good results. Following is the method:

"Dissolve 1 gramme of sodium salicylate, previously dried at 100° to constant weight, in a sufficient quantity of distilled water to make the solution measure 100 mils. By means of a pipette, measure 10 mils of this solution into a glass-stoppered flask of about 250 mils capacity. Add 75 mils of distilled water and 50 mils of tenth-normal bromine V. S., followed by 5 mils of hydrochloric acid. Stopper the flask and allow it to stand for fifteen minutes, shaking occasionally. Then add 10 mils of potassium iodide T. S. and titrate the liberated iodine with tenth-normal sodium thiosulphate V. S., using starch T. S. as indicator. The difference between the amounts of bromine V. S. and sodium thiosulphate V. S. multiplied by 2,667 gives the percentage purity of the sodium salicylate.

"Each mil of a tenth-normal bromine V. S. used corresponds to 0.002667 Gm. of sodium salicylate."—J. Am. Pharm. Assoc., 9 (1920), 878. (Z. M. C.)

Sodium Stearate and Oleate.—*Products of Vacuum Distillation of.*—Studying the Engler hypothesis of petroleum production, Pictet and Potok submitted the sodium salts of the above fat acids to vacuum distillation (13 to 15 mm. pressure). From sodium stearate, they obtained the hydrocarbons, $C_{10}H_{22}$, $C_{14}H_{30}$, $C_{15}H_{32}$ and $C_{34}H_{70}$. From sodium oleate they obtained the unsaturated hydrocarbons, C_9H_{18}, $C_{10}H_{20}$, $C_{11}H_{22}$ and $C_{13}H_{26}$. They point out that all of these hydrocarbons are found in American (Pennsylvania) petroleum. On the other hand, the distillates contained no traces of the naphthenes found in Russian (and California) petroleum.—Helv. Chim. Acta., through J. pharm. chim., 21 (1920), 96.

Tartaric Acid.—*Antimony Compounds of.*—A study by A. Blanchetiere of the solution of antimony hydroxide in a solution of tartaric acid confirms Jungfleisch's view that the process is one of esterification. The monostibiotartaric acid is best obtained by extraction of complexes, richer in tartaric acid, and with acetone.—Bull. Soc. Chim., through J. Soc. Chem. Ind., 39 (1920), 543A.

Potassium Boro-Tartrate.—*Use in Epilepsy.*—Marie, Crouzel and Bouttier find that borates show in epilepsy an efficiency equal to that of bromides, and that of the borates employed none was

better than potassium boro-tartrate. They make use of the following mixture:

Potassium boro-tartrate .....20 grammes
Glycerin .....10 grammes
Distilled water to make.....300 mils

Directions: Give during 24 hours, 3 tablespoonfuls.
—Bull. Acad. Med., through J. pharm. chim., 22 (1920), 188.

Thiocyanates.—*Permanganate Assay of.*—According to R. Meurice thiocyanates may be determined by adding to their sulphuric acid solution an excess of standardized permanganate solution and then titrating the excess with hydrogen dioxide solution. The excess of permanganate added should be at least one-half of that required for the actual oxidation of the thiocyanate. Direct titration of thiocyanates with permanganate solution yields low results.—Am. Chim. Analyt., through J. Soc. Chem. Ind., 39 (1920), 687A.

Ferrous Zymophosphate.—Following Euler's method for the preparation of salts of hexosephosphoric acid, K. Schweizer obtained a ferrous compound in the form of a greyish-green amorphous powder, tasteless and odorless, and insoluble in water and ordinary organic solvents but decomposed by mineral acids or sodium hydroxide. Administered to guinea-pigs it was in part decomposed in the stomach, but the undecomposed portion passed through the intestines unchanged.—Bull. Assoc. Chim. Sucr., through J. Soc. Chem. Ind., 39 (1920), 672A.

ALKALOIDS.

Alkaloidal Assays.—Rapp gives further details as to his method of alkaloidal assaying (See YEAR BOOK, 1919, 504).—Pharm. Zent., 61 (1920), 551 and 569.

Heiduschka and Wolf criticize the Rapp method as far as certain details are concerned. They also discuss the silico-tungstate and phospho-tungstate methods of assay.—Schweiz. Apoth. Ztg., 58 (1920), 213.

Alkaloids.—*Assay by Means of Silico-Tungstic Acid.*—In the French Codex, alkaloids are assayed by means of silico-tungstic acid and this method has been recommended by quite a number of investigators. Erwin Faigner again calls attention to this process, having found that at least three alkaloids, atropine, strychnine and cocaine, give definite compounds with the reagent possessing the formula $12WO_3 . SiO_2 . 2H_2O . 4 . Alk$. The assay is carried out by precipitating the alkaloids from an acid solution in the presence of sodium chloride, with the reagent, collecting the precipitate on a filter, washing it with water and diluted hydrochloric acid and finally drying it at 100° C. to constant weight.—*Z. anal. Chem.*, through *Pharm. Weekbl.*, 57 (1920), 388. (H. E.)

Alkaloids.—*"Shaking Out" Assay Methods.*—Beal and Hamilton report the result of an investigation undertaken to determine if there are advantages in clarifying aqueous alkaloidal solutions before extracting with an immiscible solvent. Secondarily they studied the effect of the salting out action upon the rate of extraction and also the amount of alkaloid obtained by one extraction with the immiscible solvent. Lead acetate was the clarifying agent used and its quantitative effect on the extraction of caffeine, quinine, strychnine and morphine from solutions of pure salts of each was determined.

They found that lead acetate does not interfere with the extraction of the alkaloid by immiscible solvents and that adding sodium chloride after clarification with lead acetate increases the amount of alkaloid obtainable in a single extraction. In assaying powdered nux vomica, the dilute acid extract is very much easier to handle when lead acetate is used to clarify it. Details of procedure and results of many experiments are given and the whole report is worthy of careful study.—*J. Am. Pharm. Assoc.*, 9 (1920), 9. (Z. M. C.)

Alkaloids.—*Colorimetric Assays of.*—Carlinfanti and Scelba estimate small amounts of morphine, heroine and codeine by the characteristic color produced with Erdmann's reagent (concentrated sulphuric acid, 100 mils; concentrated nitric acid, 2 drops), matching against solutions containing known strengths of the alkaloid under examination. Apomorphine is assayed through the reddish-

violet color produced with sodium bicarbonate, a color that turns green upon the addition of mercury acetate and blue when amyl alcohol is then added. Strychnine is assayed by means of the red-violet color that is produced when it is heated with sulphuric acid and bromine water.—Pharm. Zent., 61 (1920), 423.

Alkaloids.—*Conductometric Titration of.*—The conductometric method of titration has been extended successfully by I. M. Kolthoff to alkaloids and their salts in dilute solutions. For conductometric titrations of the alkaloid salts with alkali no alcohol need be used in most cases, but for acid titration of the alkaloid bases these are generally dissolved in 50 per cent. alcohol. The alkaloid salts tested included hydrochlorides of quinine, cocaine, tropacocaine, novocaine, morphine, and ethylmorphine, strychnine nitrate, and atropine sulphate. In the case of morphine hydrochloride no distinct break in the conductivity curve was found at the neutral point, but since morphine has acidic properties, further titration with alkali gives a sharp break at the point where the formation of sodium morphinate is complete. For this titration 50 per cent. alcohol is used as solvent. The alkaloid bases examined included quinine, hydrastine, codeine, morphine, nicotine, theobromine and caffeine. The last two have acidic properties, but since theobromine is a much stronger acid than caffeine, the former can be estimated in presence of the latter by dissolving the mixture in alkali and titrating with acid. The conductometric method may in certain cases be applied for the estimation of alkaloids in extracts, etc. Thus strychnine was successfully determined in a 10 per cent. solution of extract of nux-vomica.—Z. anorg. Chem., through J. Soc. Chem. Ind., 39 (1920), 733 A

Alkaloids.—*Extraction from Intestines.*—Clowes and Walters undertook to determine whether alkaloids absorbed on Lloyd's reagent are extracted from their absorption compounds in the intestinal tract and thus rendered therapeutically available. By an extensive series of animal experiments, the authors demonstrated that alkaloids, adsorbed on fuller's earth in such a manner that they cannot be extracted by water or an aqueous solution of sodium bicarbonate having the alkalinity of the intestinal contents, are released in the intestinal tract when administered orally, and that this release is not dependent on the intestinal alkalinity. They found,

however, that the dose of a given adsorbed alkaloid required to produce a specific effect was larger than that of the free alkaloid, and it was demonstrated that the rate of absorption was retarded and the action of the alkaloid prolonged. While the alkaloids were not extracted from their adsorption compounds by water or a 1 per cent. aqueous sodium bicarbonate solution, they were extracted with considerable facility by slightly alkaline and neutral soaps. The alkaloids were extracted to a certain extent by egg yolk, blood corpuscles, plasma, intestinal contents and macerated intestinal mucosa.—J. Am. Med. Assoc., 75 (1920), 655. (W. A. P.)

Alkaloids.—*History of.*—Tschirch comments on the early work of Sertürner and Derosne, on the isolation of a new plant constituent (presumably morphine) published in 1806, but fixes the date of the discovery and isolation of alkaloids as 1817. This he bases on the report of Sertürner who describes a "salt forming base" of opium. "Sertürner," he says, "laid the foundation for the isolation of a series of well defined compounds and became the founder of the modern alkaloidal research."

Following the brief survey is a chronological table of the isolation of alkaloids, glucosides, saponins, etc., for the past century, together with the source of the constituent and the investigator's name.—Schweiz. Apoth. Ztg., 58 (1920), 349. (H. A. L.)

Aconitine.—*Resistance to Putrefaction.*—H. P. S. Palet killed a rat by the subcutaneous injection of two mgms. of aconitine. The carcass was left to putrefy for several days in the air, then enclosed in a metal box, and buried for two months. The pulped viscera were then extracted with absolute alcohol acidified with ten per cent. of tartaric acid, and kept at 60° for fifteen minutes. The cooled liquid was filtered and distilled *in vacuo*. This extraction was twice repeated. The final residual extract was dissolved in water, and filtered. It was then shaken out with ether while still acid. The ether was removed and the aqueous portion was rendered faintly alkaline with sodium bicarbonate, and again shaken out with ether and with chloroform. The last extract was evaporated, and the residue dissolved in 10 per cent. acetic acid. This solution gave positive reactions with Mayer's and Monti's reagents, had the characteristic numbing action on the tongue, and gave a violet color with

a 4 per cent. solution of sodium phosphate in molybdic acid. No reaction for ptomaine was obtained by Brouardel and Boutmy's test. It is, therefore, concluded that aconitine is not destroyed by blood ferments; that it resists putrefaction for two months; that weak acids and alkalies should be used for its extraction; that it can then be characterized by the organoleptic test and by the phosphomolybdic color reaction. It is stated that crystalline aconitine gives no violet reaction with ordinary phosphoric acid, either hot or cold.—Anal. Soc. Quim. Argentina, through Pharm. J., 105 (1920), 222.

Adrenaline.—*Colorimetric Assay of.*—W. L. Scoville discusses this official colorimetric assay, pointing out the influence of temperature, effect of acidity and action of other ingredients present. He finds that when the assay is conducted with due consideration of these factors, it compares favorably with the biological test.—J. Ind. Eng. Chem., 12 (1920), 769.

Adrenaline.—*Synthesis of.*—N. Nagai prepares diacetyl protocatechuic aldehyde by treating protocatechuic aldehyde with acetyl chloride. The diacetyl compound is then treated in equimolecular proportions with nitromethane at ordinary temperatures in feebly alkaline solution. Crystals of *diacetoxyphenylnitroethane,* $(CH_3CO_2)_2=C_6H_3CHOHCH_2NO_2$ are obtained and these upon treatment with acetic acid, powdered zinc and an equimolecular proportion of 35 per cent. formaldehyde solution forms *diacetyl adrenalin* $(CH_3CO_2)_2=C_6H_3—CHOHCH_2NHCH_3$. By removal of the acetyl groups, by action of hydrochloric acid, crystals of adrenalin hydrochloride are eventually obtained.—Abs. Chem. Soc., through J. pharm. chim., 21 (1920), 440.

Adrenaline.—*Use in Hemorrhages.*—E. Barbier reports that intravenous injections of adrenalin (0.3 milligramme to each kilogramme of body weight) is of great value in serious cases of hemorrhage.—J. pharm. chim., 21 (1920), 330.

Aniline.—*Determination of Purity of.*—C. L. Knowles points out that assay processes for determining the absolute purity of aniline are not entirely satisfactory and that the various physical

constants as published in the literature show many discrepancies For these reasons he has redetermined the constants for perfectly pure sample of aniline and finds that it has the freezing point —6.24°; the boiling point 184.39° at 760 mm.; the density 15/15 of 1.0268; and the refractive index at 20° of 1.5820. He further concludes that the best criterion of the quality of aniline is its freezing point.—J. Ind. Eng. Chem., 12 (1920), 881.

Aniline.—*Formation of Salts of.*—Sabalitschka and Daniel noticed that salts of certain dibasic acids with aniline seemed to break up more or less into the neutral salts and the free base in the presence of water. They therefore thought that possibly the contention of Anselmino that only acid salts are formed from dibasic acids with certain aromatic bases, such as aniline. Various experiments were conducted in attempts to obtain such neutral salts in aqueous solution but were made without success however and they conclude that the results prove the non-existence or unstable character of the normal salts of aniline and its homologues with the dibasic acids which were used in the experiments.—Ber. dtsch. Pharm. Ges., 30 (1920), 481. (H. H. S.)

Aniline.—*Industrial Poisoning from.*—M. Nassauer reports that workmen exposed to the vapors of aniline for a number of years eventually develop cancer of the bladder. — Z. angew. Chem., through Am. J. Pharm. 92 (1920), 679.

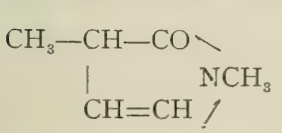
Areca and Physostigma.—*Variation in Alkaloid Content of.*—L. Rosenthaler in the fifth of a series of communications studies the alkaloidal content of *Areca Catechu.* Several pages of tabulations of results of many analyses are provided. The results of assays of calabar beans are then described and 81 results tabulated.—Ber. dtsch. Pharm. Ges., 30 (1920), 392. (H. H. S.)

Aribin.—*Identity with Harman.*—A comparison by E. Späth of aribin, its hydrochloride, its aurichloride, its chloroplatinate, and its picrate showed their identity with harman and its derivatives.—Monatsh., through J. Soc. Chem. Ind., 39 (1920), 312 A.

Atropine.—*Use in Seasickness.*—As the result of two years' investigation of the causes and prevention of seasickness, conducted during a period of two years afloat, Cazamian recommends the hypodermic injection of atropine as the most effectual treatment. To cure the symptoms, one hypodermic injection of 1/50 to 1/30 grain is given; it is rarely necessary to give another dose. In some cases it may be desirable to give another 1/100 grain twelve to twenty-four hours after the first dose. In a late stage of seasickness, with low blood pressure and prostration, the combination of adrenaline with atropine is found to have a very beneficial result. As a means of preventing seasickness, 1/60 grain of atropine is injected subcutaneously on embarking, and may be repeated for three days if the weather is rough.—Arch. Méd. Pharm. Nav., through Pharm. J., 104 (1920), 169.

Atropine, Cocaine and Stovaine.—*Toxicological Detection of.*—M. Guerbet submits a method based upon the diazotization of the benzoic acid radical, consisting in nitrating the benzoic acid, reducing the mixed nitrobenzoic acids, diazotizing the aminobenzoic acids, and coupling the diazo compounds with β-naphthol to form an orange-red mixture of azo dyes. It is equally applicable to substances such as cocaine or stovaine, which contain a benzoyl group, or atropine, which on oxidation yields benzoic acid. The test may be carried out in a few minutes on a watch-glass with 0.0001 gramme of material without isolating or purifying the intermediate products. For toxicological work the test may be applied to extracts of organs prepared by Stas' method.—Comptes rend., through J. Soc. Chem. Ind., 39 (1920), 559 A.

Bufotenine.—*An Alkaloid from the Toad.*—From an aqueous extract of the toxin of *Bufo vulgaris*, H. Handovsky has obtained an alkaloid, which he calls *bufotenin*. This has the formula



—Arch. Exp. Path. Pharmacol., through J. pharm. chim., 22 (1920), 438.

Caffeine.—*A New Compound of.*—J. Abelin describes the compounds of caffeine and theobromine with acetylsalicylic acid. He mentions a number of organic acids, other than benzoic and salicylic, that produce water-soluble double salts with caffeine or theobromine and metals, such as sodium or calcium.—Apoth. Ztg., through Pharm. Zent., 61 (1920), 298.

Caffeine.—*Assay of.*—In samples where the quantity of caffeine is quite small, E. Vautier decomposes the crude caffeine obtained by ethereal extraction, by Kjeldahl's method (1 mil of *N*/10 acid=0.00485 gramme of anhydrous or 0.00530 gramme of hydrated caffeine). If necessary the crude caffeine may first be partially or completely purified, *e. g.*, after removal of fats its aqueous solution is treated with 0.1—0.2 gramme of sodium carbonate to fix the humic acids, and after evaporation and complete drying the caffeine is extracted in the pure state by chloroform.—Mitt. Lebensmittelunters Hyg., through J. Soc. Chem. Ind., 39 (1920), 423 A.

Caffeine.—*Production from Coffee Soot.*—George E. Ewe, of Philadelphia, gives a number of suggestions for reclaiming a portion of the constituents which are volatilized in the roasting process. The soot which collects in the flues and on the upper inner surface of coffee roasters frequently contains, he states, sufficient caffeine to warrant its being used as a raw material for this alkaloid. Some analyses of coffee soot yielded as high as 22.20 per cent.—Am. J. Pharm., 92 (1920), 310. (J. K. T.)

Cevine and Sabadinine.—Hess and Mohr's investigation of the alkaloids themselves, of their hydrogen sulphates, potassium salts, aurichlorides, hydrochlorides, and monobenzoyl-derivatives, shows them to be identical. The formula is $C_{27}H_{43}O_8N$. Certain corrections of the data recorded in the literature are given. The alkaloid crystallizes with 3.5 mols. H_2O, melting point 110°. The hydrogen sulphate (+2.5 H_2O) has melting point 250° (decomp.) after becoming discolored at 210°. The hydrochloride forms anhydrous needles, melting point 247°.—Ber., through J. Soc. Chem. Ind., 39 (1920), 80A.

Chelerythrine.—Bauer and Hedinger have prepared chelerythrine from sanguinaria rhizomes by mixing the drug with milk of

lime, drying on a water bath, and extracting the alkaloids with a mixture of equal parts of ether and benzin. From this solution they were removed by solution of citric acid, and, after the addition of ammonia, transferred to benzene. On evaporation of the benzene solution the total alkaloids are obtained. The proportion found varied from 0.66 to 1.74 per cent. From this mixture chelerythrine can be obtained by repeated crystallization from alcohol. It is readily soluble in chloroform and benzene, less readily in alcohol, ether, acetone, and methyl alcohol. The chloride crystallizes in yellow needles of the formula $C_{21}H_{17}NO_4H_2O$, the iodide in dark red needles; oxalate, reddish-yellow. The presence of a methoxy group could not be detected.—Arch. Pharm., through Pharm. J., 105 (1920), 510.

Chelidonium Alkaloids.—On the basis of the results obtained by J. Gadamer structural formulæ are proposed for chelidonine and α- and β-homochelidonines.—Arch. Pharm., through J. Soc. Chem. Ind., 39 (1920) 80 A.

Cinchona Alkaloids.—*Assay of.*—Bamberger reviews the various pharmacopœial methods for assaying quinine in cinchona bark, also other methods which have appeared from time to time in the literature since 1910. Based on tests designed to overcome the demonstrated shortcomings of the various methods, he has evolved the following method for which he claims speed, sufficient accuracy, lack of complicated apparatus, minimum amount of sample required, and sufficient simplicity to yield accurate results in the hands of the average pharmacist: To a 2.5 gramme sample of cinchona bark contained in a 200 mil flask, a mixture of 2 mils of hydrochloric acid and 20 mils of distilled water are added. The flask and contents are heated on a water bath for 10 minutes and then cooled by immersion in cold water. The contents of the flask are then treated with a mixture of chloroform 25 grammes and ether 50 grammes, shaking vigorously. Five grammes of caustic soda solution are then added. Shake about 300 times during two or three minutes and then add 40 to 50 grammes of calcium sulphate while shaking constantly. Decant without filtering, 60 grammes of the chloroform-ether mixture (representing 2 grammes of cinchona bark) into a separatory funnel and shake this out twice with 5 mils

of n/10 hydrochloric acid and twice with 10 mils of water occupying 2 minutes for each shaking. Collect the separated aqueous liquids in an Erlenmeyer flask, add 5 drops of methyl red and titrate back with n/10 potassium hydroxide.—Pharm. Zent., 61 (1920), 257 and 268. (R. P. F.)

The following method, given by B. A. VanKetel, has given very good results in the estimation of cinchona alkaloids and the author believes it can be adapted for the estimation of the alkaloids in other plants also: 4 to 5 grammes of the powdered cinchona bark are mixed in a mortar with slaked lime and the mixture is triturated with sufficient ammonia water to obtain a granular mass. This is transferred to an extraction apparatus and is extracted with a mixture of 3 volumes of ether and one volume of chloroform. The ethereal liquid is then extracted with acid, the acid solution rendered alkaline with ammonia water, the alkaloids extracted with chloroform and the chloroform solution evaporated to dryness. As an alternative process the author recommends extracting the mixture of bark, lime and ammonia with benzene.—Pharm. Weekbl., 57 (1920), 650. (H. E.)

Cinchona Alkaloids.—*Dyestuffs from.*—Jacobs and Heidelberger summarized the work embodied in the present paper by calling attention to the fact that 5-amino-dihydroquinone couples readily with diazotized aromatic amines to form crystalline azo dyes in which the amino group is remarkably labile, boiling for a few minutes with diluted mineral acid being sufficient to replace the amino group by the hydroxyl group, with elimination of ammonia. The resulting hydroxyazo dyes are also easily crystallizable substances. Similar results were obtained using 5-amino-dihydroquinidine and 5-amino-ethyldihydrocupreine (amino-optochin) as couplers. Since it was of interest to determine whether the observed phenomena were a function of the quinoline portion of the cinchona structure, parallel experiments were run with a 5-amino-quinoline and 5-amino-6 methoxyl-quinoline.

Both of these bases coupled as did the amino alkaloids, and the amino group of the resulting dyes was readily eliminated and replaced by hydroxyl, lability being greater in the case of the methoxy derivatives.—J. Am. Chem. Soc., 42 (1920), 2278. (J. L. M.)

Cinchona Alkaloids.—*Experiments in Synthesis of.*—Jacobs and Heidelberger give improved methods for the preparation of 5-nitro and 5-amino-dihydroquinine, and it is shown that under the usual conditions of nitration with nitric and sulphuric acids sulphonation also occurs, and 5-nitro-dihydroquininesulphonic acid is formed as a by-product. The extension of the methods of nitration and reduction to ethyl-dihydrocupreidine led to the formation of the nitro and amino derivatives of these alkaloids, and descriptions of these new substances as well as 5-nitro-dihydroquinine, are given. In a second paper, the authors describe the so-called "desoxy" derivatives of dihydroquinine and dihydroquinidine, together with certain of their salts, homologues, and the alkaloidal derivatives encountered in their preparation. It is proposed that the substitution of the suffix "ane" for the prefix "desoxy" would simplify the terminology of this group of substances.

The series dihydroquinine, chlorodihydroquinine, dihydroquinone, dihydrocupreine, ethyldihydrocupreane, resulting in the preparation of an analogue of ethyldihydrocupreine (optochin) were prepared and studied.—J. Am. Chem. Soc., 42 (1920), 1481 and 1489. (J. L. M.)

Cocaine and Tropine.—*Structure of.*—J. Von Braun describes some experiments performed by him in which he endeavors to determine whether the arrangement of the various groups in the tropine and cocaine formulæ must always be that of these products as found in nature. He describes in detail how he prepared synthetically substances which have similar action to atropine and cocaine and yet have a different arrangement of the groups (double bonds, etc.) from that of the natural products. In some cases the synthetic products were inferior to the natural in action but in others they were superior.—Ber. dtsch. Pharm. Ges., 30 (1920), 295. (H. H. S.)

Codeine.—*Determination of*—Annett and Sen proceed as follows: Ten grammes of dry opium, or a suitable quantity of other substance (*e. g.,* alkaloids, plant material, etc.), are mixed with 4 grammes of calcium hydroxide with the gradual addition of 100 mils of water; the mixture is stirred for 30 minutes, filtered, 50 mils of the filtrate is treated with 40 mils of 2 per cent. acetic acid and 10 mils of basic lead acetate solution (sp. gr. 1.25), filtered, 75

mils of the filtrate is treated with 2.5 grammes of calcium hydroxide, the mixture shaken for 30 minutes, filtered, and 50 mils of the filtrate extracted with three successive quantities (50 mils each) of toluene. The united extracts are filtered and dry gaseous hydrogen chloride is introduced in slight excess; this excess is removed by a current of air, the precipitated codeine hydrochloride is collected on a filter, dissolved in a small quantity of water, the solution evaporated, and the residue dried and weighed. If the treatment with basic lead acetate is omitted, the codeine hydrochloride obtained is highly colored, but the error introduced is not more than 5 or 10 per cent. —Analyst, through J. Soc. Chem. Ind., 39 (1920), 702 A.

Creatinin.—*Assay in Concentrated Bouillon.*—E. Vautier finds that the Folin colorimetric assay for creatinin in urine can be applied to the determination of the quality of commercial bouillon. He gives in the article details of manipulation.—Trav. Chim. alimentaire, through Schweiz. Apoth. Ztg., 58 (1920), 353 and 364.

Cystine.—*Microchemical Reaction of.*—Cystine can easily be detected in a urinary sediment by the hexagonal form of its crystals. Denigès found that cystine gives with hydrochloric acid a compound, which is difficultly soluble in the acid and forms prismatic crystals. The crystals resemble those of uric acid but differ from the crystals of this acid by their solubility in water.—Bull. soc. pharm. Bordeaux, through Pharm. Weekbl., 57 (1920), 774. (H. E.)

Diacetyl-apomorphine.—*Therapeutics of.*—This alkaloid made by heating together on a water-bath apomorphine hydrochloride and acetic anhydride, has been found by M. Tiffeneau to be twice as active an emetic as apomorphine. The dose in milligrammes to kilogramme of animal has been found to be:

	Diacetyl-apomorphine.	Apo-morphine.
Intravenously	0.02 to 0.03	0.05
Subcutaneously	0.1	0.2 to 0.3
Intraperitoneally	0.2 to 0.25	0.36

Apomorphine and its acetyl compounds have about the same toxicity. —Comp. rend. Soc. Biol., through J. pharm. chim., 21 (1920), 204.

Emetine.—*Posology of.*—At a meeting of the Société de Thérapeutique, a discussion of the posology of emetine, led by Professor Chauffard, brought out the fact the best method of administration of the hydrochloride was by the hypodermic injection of 3 to 5 centigrammes each running six days followed by a two weeks rest. In the Orient and Tropics it was found that the total dose during treatment up to 0.80 grammes was tolerated but that this limit should not be exceeded, because of the cumulative action of the alkaloid. During the acute stage of the dysentery, doses of 4 centigrammes for 5 or 6 days, followed by a fortnight of rest; then a second series of 4 to 5 injections followed by a second fortnight of rest; and finally a third series if necessary.—J. pharm. chim., 21 (1920), 65.

Emetine Hydrochloride.—*Manufacture of.*—J. L. Ague asserts that the emetine hydrochloride of commerce is sometimes not a pure product, but contains a certain amount of cephaëline and psychotrine, to which the local irritant action on injection is attributable, and in addition has a less powerful amebicide action than the pure alkaloid. He indicates the following method for preparing the pure salt: Two hundred grammes of powdered ipecacuanha-root are exhausted with a mixture of 800 mils of ether and 400 mils of chloroform; after a few hours the mixture is shaken and 160 mils of 20 per cent. solution of ammonia added, and the whole allowed to stand for three hours. After adding 160 mils of distilled water and allowing to stand the liquid is decanted, treated with 4 per cent. hydrochloric acid, rendered alkaline by the addition of 20 per cent. solution of ammonia, whereupon it is extracted with 200 mils of ether to which a few mils of chloroform have been added. The ether is removed by distillation, and the residue—emetine—is treated with solution of caustic soda, which dissolves the cephaëline and psychotrine; the pure emetine is extracted by means of ether, and the hydrochloride is formed by the action of 4 per cent. hydrochloric acid on the pure alkaloid.—Bol. Farm. Lima, through Chem. & Drug, 93 (1920), 1364.

Emetine Bismuth Iodide.—*A New Method of Administration.*—T. J. G. Mayer points out that the usual methods of administering emetine bismuth iodide produces nausea. He prepares pills of the

chemical with mutton suet, coating each pill with a layer of melted mutton suet. The solid suet coating does not melt in the stomach and the pill does not therefore digest until it reaches the intestines. Each pill is made to weigh about 7½ grains and contains 1½ grains of the chemical.—Prescriber, through Am. J. Pharm., 92 (1920), 837.

Ephedrine and Pseudoephedrine.—*Synthesis of.*—Improvements by A. Eberhardt in the preparation of α-methylaminopropiophenone from methylamine and α-bromopropiophenone and the substitution of hydrogen under pressure in the presence of palladinized charcoal for sodium amalgam in the reduction of the ketone have rendered possible the production of phenyl-α-methylaminoethyl carbinol, $C_6H_5CH(OH).CH(NCH_3).CH_3$ in considerable quantity. A fuller study of this base [B], melting point 114° C., has revealed the existence of an isomeric base [A], melting point 76° C., and a number of salts and derivatives of each are described. The inactive synthetic compounds, their salts and derivatives, show great similarity to the natural, optically active bases both in appearance and melting point; this is particularly noticeable in the case of the B-base and pseudoephedrine. The synthetic bases can be converted one into the other in a similar manner to ephedrine and pseudoephedrine; this can be partly effected by hydrochloric acid at the ordinary pressure, but more readily at higher temperature and under increased pressure, whilst the base A is completely converted into base B by acetylation but not by benzoylation.—Arch. Pharm., through J. Soc. Chem. Ind., 39 (1920), 762 A.

Ethylhydrocupreine.—*Use in Pneumonia.*—J. A. Kolmer regards this chemical (optochin) as a highly important medicament. He thinks it is the first chemical poison found that has a specific selective action on a single disease germ. By this is meant that optochin selects the pneumonia germs from all other germs and kills them, while it does not kill the others with anything near the same certainty. He classes optochin with arsphenamine (salvarsan), which is so valuable because it is a specific poison for *Spirochæta pallida* and is thus a specific cure for syphilis. Thus optochin is expected to become a specific cure for pneumonia.

Dr. Kolmer recognizes the difficulty of the administration of optochin, because when it is administered in doses that will kill the pneumonia germs it is apt to be poisonous to the patient. He suggests that the article is worthy of intense research and study, with the object of discovering suitable ways of administering it or of modifying its composition so that, while it retains its specific poisonousness for the germs, it will be less of a poison for the patient.—Mercks Rep., 29 (1920), 5.

Euquinine.—*Incompatible with Resorcinol.*—The Elberfelder Farbenfabriken calls attention to the fact that when euquinine and resorcinol are mixed together, the mixture will soon become black and resinification will take place.—Pharm. Zent., 61 (1920), 20. (H. E.)

Hexamethylenamine and its Preparations.—The great use of formaldehyde and hexamethylenamine both for technical and medicinal purposes has induced D. van Os to take the pharmacy of these compounds as subject for his dissertation. The turbidity occurring in formaldehyde soap solutions is not due to condensation of the soap with the formaldehyde or to a polymerization of the latter, but to a reduced solubility of the soap in formaldehyde solutions. Free alkali present in the soap reacts on the formaldehyde with the formation of formate and methyl alcohol. The formaldehyde soaps from olive oil, castor oil and coconut oil are more soluble than those of other oils and in regard to lathering the soap of olive oil is preferable for making formaldehyde-soap solutions. For estimating hexamethylenamine, picric acid is recommended, but Esbach's reagent, which contains picric acid, cannot be used, especially in urine, because it precipitates albumin also. A great number of salts of hexamethylenamine with various acids were prepared, among these some new ones, oxalate, citrate dimethyl sulphate, veronal, saccharin, atophan and hexophan. The author believes that the salt made with dimethyl sulphuric acid would be preferable to the acid alone for filling gas masks because it is less toxic than this. Of all the new compounds probably only the salts of phenlycinchoninic acid (atophan) and oxyphenylcinchoninic acid (hexophan) have therapeutic value because the uric acid and urates dissolving properties of these acids are increased by that of hexamethylenamine.

Hexamethylenamine combines with these acids in the molecular ratio 1:1, showing that acid salts are formed. The same is the case with esters and metallic salts. Compounds are formed with such substances which contain the radical of a strong acid and in the case of salts when they contain a weak base. Thus compounds are obtained with ethyl bromide, dimethyl sulphate, mercuric chloride, cupric chloride and ferric sulphate, while ethyl acetate, salol, barium chloride, potassium sulphate, etc., which contain a weak acid or a strong base, do not react. Hexamethylenamine is precipitated by Mayer's and Wagner's reagents, by tannic acid and picric acid and forms double salts with mercuric chloride, gold chloride and platinic chloride, which are characteristic and can be used for the identification of the amine. It also forms salts which are easily soluble in water and are insoluble in the immiscible solvents. When these solutions are rendered alkaline, the amine can be extracted by these solvents. Hexamethylenamine can, therefore, be considered as a synthetic alkaloid. It does not form compounds with other alkaloids, but slowly precipitates morphine from solutions. When administered internally hexamethylenamine is decomposed in the stomach and only a small amount reaches the bladder. It should, therefore, be dispensed in hard gelatin capsules, which are not easily attacked by the gastric juice. However, some of the gastric juice may diffuse into the capsules and liberate formaldehyde from the amine. Howell and Keyser, some years ago, reported that hexamethylenetetramine interferes with the gastric digestion. This can be obviated by administering it in the form of the borate or citrate, but never as salicylate or sulphosalicylate.—Pharm. Weekbl., 57 (1920), 1406. (H. E.)

Hexamethylenamine.—*Effect of Huge Doses of.*—G. Patein reports on two French soldiers who were returned from German prisons to France in apparently advanced stages of nephritis. In each case, the soldier had ingested huge amounts of hexamethylenamine; over 100 grammes during 24 hours and 1,000 grammes during three months. Upon their return to France, the two soldiers were treated in hospitals until they were apparently well. The recovery, however, was only temporary, for in one case within 10 months; in the other, within 18 months, arthritic symptoms set in, from which recovery was very slow.—Bull. Acad. Med., through J. pharm. chim., 22 (1920), 190.

Hexamethylenamine.—*Isotonic Solutions of.*—All ordinary aqueous solutions of urotropine are hemolytic. An isotonic solution can be obtained by means of a 4:1000 solution of sodium chloride; of this, 100 mils, with 30 grammes of hexamine gives an isotonic solution, the daily dose of which is 5 to 10 mils. This preparation cannot be sterilized at 120°, as the hexamine is decomposed. Either the drug must be dissolved in the previously sterilized sodium chloride solution, or the preparation must be tyndallized at 70°.—Prensa Méd. Argentine, through Pharm. J., 105 (1920), 188.

Hexamethylenamine.—*Manufacture of.*—W. Herzog proceeds as follows: Commercial ammonium carbonate is dissolved in 40 per cent. formaldehyde solution, the reaction taking place readily without application of heat and with brisk evolution of carbon dioxide. The solution is evaporated to dryness on a water bath under reduced pressure, and the residue is sublimed in vacuo or recrystallized from absolute alcohol. To compensate for its variable composition the amount of ammonium carbonate taken should be about 10 per cent. in excess of the theoretical quantity. The yield of hexamethylenetramine is about 66 per cent. of the theoretical amount.—J. Soc. Chem. Ind., 39 (1920), 279 A.

A Sander finds that the formation of hexamethylenamine by cold treatment of an ammonium salt with excess of formaldehyde is not confined to ammonium carbonate but occurs with most ammonium salts, and the reaction is, in fact, utilized for the estimation of ammonia. By the use of the carbonate, however, a purer product is more readily obtained.—Z. angew. Chem., through J. Soc. Chem. Ind., 39 (1920), 383 A.

Hexamethylenamine.—*Presence in the Living Plant.*—C. Van Zijp believes that contrary to the statement of O. Loew that in the presence of formaldehyde and of an ammonium salt no hexamethylenetetramine is formed in the living protoplasma, this product is formed, because he found by microchemical experiments that not only ammonia but also ammonium salts form hexamethylenamine.

Van Zijp's test is as follows: To an aqueous solution of hexamethylenamine strong hydrochloric acid is added until the liquid is slightly acid and the solution is then dried over lime. Upon the addition of iodine-potassium iodide to the residue, there are pro-

duced microscopically small brown crystals which possess a characteristic form. The same crystals are obtained when to an aqueous solution of an ammonium salt formaldehyde is added, the mixture is allowed to dry and the residue treated with iodine-potassium oxide solution. The reaction is very characteristic and can be used for the identification of ammonia in ammonium salts, even such as ammonium-magnesium phosphate, because potassium and sodium do not interfere with it.—Pharm. Weekbl., 57 (1920), 1345 and 1348. (H. E.)

Hexamethylenamine.—*Solubility of.*—F. Utz finds 100 grammes of the following solvents dissolve the amount of hexamethylenamine given below: water, 167 gm.; ethyl ether, 0.06 gm.; trichlorethylene, 0.11 gm.; xylene, 0.14 gm.; carbon disulphide, 0.17 gm.; benzene, 0.23 gm.; tetrachlorethane, 0.5 gm.; acetone, 0.65 gm.; carbon tetrachloride, 0.85 gm.; amyl alcohol, 1.84 gm.; absolute alcohol, 2.89 gm.; 90 per cent. alcohol, 5.58 gm.; methyl alcohol, 7.25 gm.; chloroform, 13.40 gm. The chemical is insoluble in petroleum ether.—Süddtsch Apoth. Ztg., through J. pharm. chim., *22* (1920), 353.

Hydrastine and Berberine.—*Extraction of.*—E. Schmidt gives the following method for extracting hydrastine and berberine independently from the drug: Exhaust the hydrastis root by percolation with ammoniated benzol for 24 hours. Shake out the percolate with 3 per cent. sulphuric acid and precipitate the hydrastine with ammonia. The hydrastine is purified by solution and recrystallization from alcohol.

The marc is freed from benzol, moistened and extracted with water acidified with acetic acid. This percolate is treated with hydrochloric acid and the precipitated berberine hydrochloride is washed free of hydrochloric acid with the aid of small amounts of water.—Pharm. Zent., 61 (1920), 83. (R. P. F.)

Hydroquinine.—*Toxins of.*—I. Traube finds that with the hydrocupreines and their homologues there is a parallelism between their disinfecting power against many bacilli and cocci, mostly Gram positive organisms, and their surface action. An analogy also exists between the susceptibility of bacteria toward basic stains and their

power of adsorption of hydrocupreines and their toxins.—Biochem. Zsch., through J. Soc. Chem. Ind., 39 (1920), 133 A.

Isoconiine.—*Non-existence of.*—Hess and Weltzien while carrying on researches with asymmetric trivalent carbon atoms found that the optical activity claimed by Ladenburg for his synthetic coniine must be due to impurities and that isoconiine does not exist. —Pharm. Zent., 61 (1920), 371. (O. M.)

Methyl-hydrastinine Hydrochloride.—The formula of this synthetic compound is $C_{12}H_{14}O_2.HCl$. It is soluble in water and alcohol, yielding a slightly yellowish or greenish-yellow solution. It melts at 213° C. (with decomposition). Its physiological and pharmacological action is similar to that of hydrastinine. The minimum lethal dose is 0.1 gramme for 1 kilogramme rabbit.—Pharm. Zent., 61 (1920), 262. (R. P. F.)

Morphine.—*Presence of Sugar Interferes in Assay.*—Damas states that determinations of morphine in the presence of saccharose are highly erroneous, the increase in concentration of the saccharose solution corresponding to a marked decrease in the quantity of morphine found. Thus in a solution containing 0.75 gramme morphine dissolved in a 6 per cent. saccharose solution no morphine will be found. This error may be of importance to the laboratories where such mixtures are occasionally examined.—L'Union Pharm., through Merck's Rep., 29 (1920), 145.

Nicotine.—*Amount Found in Tobacco and Its Smoke.*—Nicotine content of cigarettes was determined and then by aid of an "automatic smoker" the amount present in smoke and inhalations was determined by N. Asherson. The average nicotine content was 20 milligrammes. The author concludes that not more than half (about 7 milligrammes) enters the mouth. Illustration of "smoker" and tables are given.—Chem. News, 120 (1920), 150. (J. H.)

Nicotine.—*Determination of.*—Brezina gives the following simple method for estimating nicotine. The substance under examination is moistened with caustic soda or caustic potash solution and the alkaloid is distilled with steam, receiving the distillate under

water acidulated with acetic acid. In the distillate the nicotine is precipitated by the addition of a 10 per cent. solution of picric acid in acetone as nicotine picrate, which is collected on a filter, washed and dried to constant weight.—Chem. Ztg., through Drug Circ., 64 (1920), 340.

Novocaine.—*Aromatic Analogues of.*—It has been recently shown by Fränkel and Cornelius that derivatives of primary β-aminoethyl alcohol, in contrast to the tertiary N-dialkylated alkamine derivatives (stovaine, novocaine) do not possess anesthetic action. The compounds which they have examined, however, contain an acyl residue attached to the nitrogen atom in place of the alkyl radical of novocaine, and thus do not belong to quite the same type. Closer analogy is shown, according to Von Braun and Kirschbaum, by a series of substances which are now described in which a phenyl or substituted phenyl group is introduced in place of one of the alkyl groups. It is found that the aromatic substitution at the nitrogen atom of novocaine is without influence on its anesthetic power if the basicity of the molecule is also suitably increased. N-methyl-N-β-benzoyloxyethyl-*p*-phenylenediamine, $NH_2.C_6H_4.N(CH_3).CH_2.CH_2.O.CO.C_6H_5$, long slender needles, melting point 56°, is obtained by reduction of the corresponding *p*-nitroso compound, pale green powder, melting point 90°. Sodium *p*-nitrobenzoate reacts readily with β-chloro- or β-bromoethylmethylaniline yielding N-methyl-N-[β-*p*-nitrobenzoyloxyethyl]-aniline,

$$C_6H_5N(CH_3).CH_2.CH_2.O.CO.C_6H_4.NO_2,$$

yellow needles, melting point 70°, which is reduced to N-methyl-N-*p*-aminobenzoyloxyethylaniline, colorless leaflets, melting point 112°. When the solution of the latter in dilute hydrochloric acid is treated with sodium nitrite, it yields the corresponding *p*-nitroso-derivative, melting point 105 to 106°, which is almost quantitatively reduced by stannous chloride to N-methyl-β-*p*-aminobenzoyloxyethyl-*p*-phenylenediamine, $NH_2.C_6H_4.N(CH_3).CH_2.CH_2.O.CO.C_6H_4.NH_2$, melting point 98°. Sodium 3.5-dinitrobenzoate and chloroethylmethylaniline yield N-β-3.5-dinitrobenzoyloxyethylmethylaniline, melting point 121°, which is normally reduced to the corresponding diamino compound, melting point 80°.—Ber., through J. Soc. Chem. Ind., 39 (1920), 81 A.

Novocaine and Syncaine.—*Urinary Excretion of.*— R. Thieulin desiring to know how these synthetics are eliminated after intramuscular administration, first devised tests for the detection of syncaine and its decomposition products, para-amidobenzoic acid and diethylaminoethanol. Both syncaine and para-amidobenzoic acid show a red color upon the addition of sodium nitrite, hydrochloric acid and betanaphthol (see page 586); while diethylaminoethanol gives a red color with acetone and sodium nitroprusside. Syncaine hydrochloride is soluble in water, but insoluble in ether, syncaine (base) is soluble in ether, but insoluble in water; diethylaminoethanol is soluble in water, but is removed by ether from its aqueous solution if the latter is saturated with sodium chloride; while the sodium salt of para-amidobenzoic acid is soluble in water but insoluble in ether. Utilizing these various solubilities, Thienbin saturates urine with sodium chloride, then adds enough solution of soda to neutralize it and then shakes out with ether; the syncaine and diethylaminocarbinol pass into the ether, while the sodium para-amidobenzoate remains in the aqueous layer. The ethereal layer is divided into two portions and tested for syncaine and for diethylaminocarbinol. The aqueous fluid is acidulated and is shaken out with ether, when the free para-amidobenzoic acid passes into the ether layer, where it can be tested after removal of the ether.

Operating upon rabbits, Thieulin found that after intramuscular injections of syncaine, the urine showed the presence of syncaine and of both of its decomposition products.—J. pharm. chim., 22 (1920), 463.

Opium Alkaloids.—*History of.*—Rosenthaler states that the discovery of morphine may be accredited to Derosne or Sertürner, depending on the point of view. Derosne isolated morphine and narcotin, but called both "Sel d'opium." Sertürner took up Derosne's work and established the chemical identity of morphine. Hence, Rosenthaler says that if the identification is the discovery, the credit is Sertürner's; if the isolation is the discovery the credit is Derosne's. —Schweiz. Apoth. Ztg., 58 (1920), 409. (H. A. L.)

Opium Alkaloids.—*Pharmacology of.*—Resuming his work of 1915 wherein he pointed out that the morphine group of opium alkaloids, containing a piperidin-phenanthrene grouping, stimulated

the contractions and increased the tonus of smooth muscle; whereas the papaverine group, containing a benzoyl-isoquinoline grouping, inhibits the contraction and lowers the tonus of smooth muscle. D. I. Macht has recently submitted both phenanthrene and piperidine to pharmacological investigation and found that while the former was comparatively inert, piperidine was a powerful stimulant of the smooth muscle.—J. Am. Med. Assoc., through Am. J. Pharm., 92 (1920), 676.

Pelletierine and Methylpelletierine.—G. Tanret reaffirms previous results (1880) as to the properties of pelletierine and methylpelletierine, found in the bark of the pomegranate tree, and refutes the statements of Hess and Eichel (1918) as to the non-existence of optically active forms of these alkaloids. A number of salts and derivatives of the alkaloids have been prepared.—Bull. Soc. Chim., through J. Soc. Chem. Ind., 39 (1920), 638 A.

Procaine Homologues.—*Physiological Action of.*—Oliver Kamm, discussing the relationship between chemical constitution and physiological action, states that he realizes the dangers of drawing broad generalizations upon observations gathered from the testing of a small number of individual compounds, although in the present example a prediction of physiological action of a new compound, by analogy to structures of previously known compounds, has been completely substantiated. No attempt is made, therefore, to present broader generalizations or to indulge in further speculation until a larger amount of additional experimental data is available.—J. Am. Chem. Sc., 42 (1920), 1030. (J. L. M.)

Pseudo-Muscarine.—*Action of.*—Albert B. Weinhagen carried on an investigation which originally was based upon the supposition that "synthetic muscarine" might indeed be identical with the natural base; and that the additional curare action and after divergences of the synthetic product might be due to the presence of active by-products. Some support had been lent to this supposition by the fact that he had previously isolated even trimethylamine from the products when preparing "synthetic muscarine," and, therefore, suspected the presence of intermediate decomposition products as

well. In the present paper are submitted the data on the most typical experiments upon the action of nitric acid on choline.—J. Am. Chem. Soc., 42 (1920), page 1670. (J. L. M.)

Quinidine.—*Use as Heart Depressant.*—G. Von Bergmann finds quinidine of more value as a heart depressant than is quinine. He prescribes it as the sulphate in 0.2 gramme doses increasing the dose day by day. He accompanies the quinidine medication with potassium chloride, since he believes the heart conditions where quinidine is indicated come from a shortage of potassium in the system. Digitalis is contraindicated during the treatment.—Münch. Med. Wschr., through Pharm. Zent., 61 (1920), 172.

Quinine.—*Antagonism to Adrenaline.*—Clerc and Pozzi find these two substances therapeutically antagonistic. Adrenalin accelerates cardiacal action, while quinine reduces it. Adrenalin exerts a hypertensive action on the arterial pressure; while quinine shows hypotensive action.—Comp. rend., through J. pharm. chim., 21 (1920), 248.

Quinine.—*Assay in Pills.*—Since most of the quinine pills are made at the present time on a large scale and sold by wholesale manufacturers, K. Scheringa recommends assaying the pills and gives the following simple process for doing so. Ten pills are dried at a moderate heat or in a desiccator, powdered and mixed with pure sand. The mixture is then shaken well with 20 mils of a mixture of two volumes of chloroform and one volume of absolute alcohol and after clearing of the liquid has taken place, 10 mils of the liquid are evaporated and the residue dried to constant weight. From the amount of anhydrous quinine sulphate the amount of official salt is calculated. Since the quinine sulphate takes up a certain volume which amounts to 0.3 mil in the case of 10 pills each containing 0.5 gramme of the salt, a slight correction should be made in the calculation.—Pharm. Weekbl., 57 (1920), 422. (H. E.)

Quinine.—*Color Tests for.*—When to a solution of quinine or of one of its salts a slight excess of chlorine is added, followed by a few drops of pyridine, a yellow color is developed, which changes to pink and finally to purplish red, according to Ganassini. The

coloring matter is only very slightly soluble in chloroform. Quinidine and euquinine give the reaction only feebly; cinchonine and cinchonidine do not give it at all. The author further found that when to the green-colored solution in the thalleioquin reaction one or two drops of a 0.1 per cent. of freshly prepared solution of potassium ferricyanide are added, the green color changes to red and that the red coloring matter is soluble in chloroform. It is, however, essential that in this test the minimum amount of ammonia water be used.—Il policlinico, through Drug Circ., 64 (1920), 217.

Quinine.—*Discovery of.*—A fertile field for historical investigation awaits anyone who wishes to delve into poetical legend in order to trace the exact discovery of Cinchona bark, writes F. A. White in a centenary note on quinine which was isolated from cinchona bark by Pelletier and Caventou in 1820. White gives a brief sketch of the lives of both scientists. In the fall of 1820, Pelletier read a paper on "Chemical Researches on Cinchonas" at the Academy of Sciences, Paris. Pelletier gives full credit to Gomez, the discoverer of "cinchonine" in grey cinchona, and to De Labillardiere who was preparing cinchonine at the time for the French chemist and teacher Thenard, in connection with their work on cinchona. Pelletier and Caventou found that the grey cinchona bark contains a different alkaline principle than that found in yellow cinchona bark, both alkaline substances were found in red cinchona bark. Pelletier and Caventou extracted these substances with alcohol; the alcoholic extracts of cinchona were washed with slightly alkalized water until this washing water ceased to be colored. The "quinine" or second principle found by Pelletier and Caventou remained and was washed with weak hydrochloric acid to free from fatty matter. The Academy admitted in December, 1820, that Pelletier and Caventou had isolated "a particular substance which can be obtained separate from all the other principles which accompany it, and in which the febrifuge virtues of cinchona appears to reside." In 1837, Pelletier and Caventou received the Montyon prize of 10,000 francs for their discovery. In 1900, a statue of Pelletier and Caventou, the first statue to pharmacists as pharmacists, was unveiled on a public place in Paris, during the meeting of the International Congress of Pharmacy of Paris. Dr. Eugene Caventou a son of Caventou was present at the inauguration of this monument.—Am. Drug., 68 (Dec., 1920), 20. (M. O. C. D.)

Quinine.—*Effect on the Tissues.*—L. S. Dudgeon points out that although there are circumstances in which the vigorous action of quinine is highly desirable both subcutaneously and intramuscularly, yet its use is not without danger to the tissues. No matter how much care is exercised much pain and discomfort may follow as well as considerable induration and abscess formation. Tissue necrosis is produced by the use of strong solutions of quinine salts. It has been suggested that the use of dilute solutions may obviate this, but solutions so dilute as to avoid edema and tissue necrosis are not of much practical use in the treatment of disease in man. However, the limitations and dangers of their use in practice should be appreciated clearly and specifically. Injections should not be given into the same area of muscle or tissue directly adjacent, otherwise permanent injury of muscle or nerves may follow.—J. Hygiene, through Am. J. Pharm., 92 (1920), 420. (J. K. T.)

M. Klotz finds that the necrosis sometimes following the subcutaneous injections of quinine salts can be avoided by adding gelatin to the injected fluid. He dissolves 1 part of quinine hydrochloride [dihydrochloride?—Ed.] in 4 parts of a 10 per cent. solution of sterilized gelatin, boiling the mixture vigorously for several minutes to insure the sterilization of the quinine salt. The clear fluid is then placed in 1 mil sterile ampuls. The mixture solidifies within the ampul upon cooling but will become a clear fluid when heated to the body temperature.—Therap. Monatsh., through Pharm. Ztg., 65 (1920), 503.

Quinine Salts.—*Assay of Other Cinchona Alkaloids in.*—G. Mossler points out the difficulty in separating quinine salts from the other alkaloids of cinchona, particularly cinchonine and hydroquinine. The various suggested methods of separation by precipitation (e. g., use of sodium sulphate) or by changing the character of the solvent failed to give accurate results. Mossler thinks that the most likely method of assay will be found in the use of the polariscope, the optical rotation of cinchonine and hydroquinine being different from that of quinine. So far Mossler's work has not brought entirely accurate results, but the method promises to be successful.—Pharm. Monatsh., through Pharm. Ztg., 65 (1920), 425.

Quinine Hydrobromide.—*Use in Influenzal Pneumonia.*—Excellent results have followed the administration of quinine hydrobromide in the treatment of influenzal pneumonia. Of twenty-seven patients treated thus by Gaffery, only one died. An initial dose of 25 grains was given; 10 grains for the second dose; then 5 grains every four hours for the rest of the period of treatment. In no instance was any complaint made of the usual unpleasant secondary effects of the drug.—J. Am. Med. Assoc., through Pharm. J., 105 (1920), 220.

Quinine Hydrobromide.—*Distinguishing from Quinine Hydrochloride.*—Arny and Schaefer recommend the following test in order to distinguish quinine hydrochloride from quinine hydrobromide in preference to the present U. S. P. tests.

"Dissolve 1/10 Gm. of the salt in 10 mils of water and add 1 mil of normal sodium hydroxide solution. Filter off the precipitated alkaloid and to the filtrate add 1 mil of normal sulphuric acid. Now add 5 mils of tenth-normal silver nitrate solution and when the precipitate of the resulting silver halogen salt has formed add 6 mils of exactly 10 per cent. ammonia water and shake. A resulting clear solution indicates that the salt employed was the hydrochloride while any insoluble precipitate indicates that it was the hydrobromide."

It is suggested that control tests be run on known samples to check reagents used.—Am. Drug. (Nov., 1920), 26. (H. M.)

Quinine Hydrochloride.—*Incompatibility with Mucilages.*—A prescription consisting of 200 grammes of a decoction of Irish moss and 2 grammes of quinine sulphate is frequently used in Holland. By replacing, however, quinine sulphate by an equivalent amount of quinine hydrochloride, the liquid coagulated and a heavy precipitate was produced on standing. Keulemans, therefore, dissolved quinine hydrochloride in decoctions of linseed, salep and marshmallow and found that these preparations also became semi-solid or even so hard that they could not be poured out from the container. Other alkaloids like cocaine hydrochloride, atropine sulphate and morphine hydrochloride do not coagalate the decoctions. Quinine salts seems to exert a strong antiseptic power, because decoctions in which quinine sulphate had been dissolved kept for at least six weeks.—Pharm. Weekbl., 57 (1920), 678. (H. E.)

Quinine Sulphate.—*Production in Java and British India.*—P. Van Leersum presents an interesting historical description of the use of cinchona in South America and the discovery of the cinchona alkaloids and concludes his paper with descriptions of the methods of quinine extraction now in vogue in Java. For details, the reader is referred to the original article.—Algem. Landbonweekb., Nederl. Ind., through Chem. & Drug., 92 (1920), 1213.

Quinine and Urea Hydrochloride.—*Use as a Local Anesthetic.*—Quinine is a protoplasmic poison and tissue necrosis may be caused by strong solutions of quinine salts. That this deleterious reaction actually does occur and has mitigated against the general use of quinine and urea hydrochloride is confirmed by the report of the Committee of the A. M. A. on the Advantages and Disadvantages of Local Anesthesia in Nose and Throat Work. The committee reported that the only local anesthetic that produces edema and sloughing is quinine and urea hydrochloride. The committee found that, as this local anesthetic has been abandoned in other fields of medicine, so it has been discarded for use in nose and throat operations. Two physicians who had published articles extolling the value of quinine and urea hydrochloride in nose and throat operations now state that they have discontinued its use, though they had not published this unfavorable conclusion.—J. Am. Med. Assoc., 74 (1920), 559.

Sparteine and Guaiac.—*New Tests for the Identification of.*—Briefly, this test given by E. H. Grant, consist in adding bromine water to the alkaloidal residue. A yellow precipitate or orange-colored oil (with large amounts) results and this dissolves on warming. Then it is evaporated to dryness on a water-bath, the hot beaker inverted over concentrated ammonia water when a pink color appears if sparteine is present. Considerable care in manipulation is necessary and Mr. Grant explains details thoroughly. His test for guaiac gives results where the preparation is old and does not respond to the blue oxidation test. A chloroformic extraction is made and divided into two portions, one being evaporated to dryness and the residue treated with concentrated sulphuric acid. An intense red color indicates guaiac (also some saponins and resins). The second portion of chloroformic extraction is shaken with an equal

volume of bromine water. As the chloroform dissolves a flash of blue or purple may be seen. Separation of and evaporation of the chloroformic layer and treatment with concentrated sulphuric acid gives a brilliant green if guaiac is present.—J. Am. Pharm. Assoc., 9 (1920), 704. (Z. M. C.)

Strychnine.—*Sodium Chloride as Antidote for.*—Giribaldi experimenting upon rabbits and dogs finds that sodium chloride, either orally or subcutaneously, given within five minutes after the ingestion of strychnine, lessens its toxic effect.—Gazz. Ospedali Cliniche, through Am. J. Pharm., 92 (1920), 600.

Strychnine.—*Test for.*—H. E. Buc recommends the following: To 0.5 mil of the strychnine salt solution is added 1 gramme of amalgamated zinc and 0.5 mil of hydrochloric acid. After 15 minutes the liquid is decanted and treated with 0.02 per cent. potassium ferricyanide solution, added drop by drop. A pink to rose-red coloration develops. Large amounts of some alkaloids and other organic substances interfere, but in their absence the test will detect 0.001 milligramme of strychnine.—J. Assoc. Off. Agric. Chem., through J. Soc. Chem. Ind., 39 (1920), 347A.

Strychnine Salts.—*Incompatibility with Glycerophosphates and Cacodylates.*—Discussing the paper of Fleury and Hourwitz (YEAR BOOK, 1919, 535), A. Leclère points out that the precipitation of the alkaloid, strychnine may be avoided by the addition of sugar to the solution. He recommends that in subcutaneous injection the following solution be used:

Sodium glycerophosphate	100 grammes
Sodium cacodylate	100 grammes
Strychnine sulphate	1 gramme
Saccharose	250 grammes
Water, to make	1000 mils

—J. pharm. chim., 21 (1920), 183.

Theobromine.—*Solubility of.*—According to R. V. Wadsworth, the high solubilities for theobromine recorded by Mitscherlich appear to have been due to the presence of caffeine as an impurity. The solubility of the pure alkaloid in various solvents is as follows: Ether at 15.5°, 0.003; at boiling point, 0.003; trichloroethylene at

15.5°, 0.020; at boiling point, 0.030; chloroform, 0.06 and 0.07; water, 0.06 and 0.70; and tetrachloroethane, 0.090 and 0.870 per cent.—Analyst., through Pharm. Era, 53 (1920), 241.

Theobromine Sodium Salicylate.—*Assay of.*—G. Mossler proceeds as follows:

Dry the sample at 100°, weigh 1 gramme of this in a flask, add 5 mils of water and enough normal hydrochloric acid to make the methyl red indicator turn to a faint rose color. Then add 15 mils of concentrated hydrochloric acid, heat the mixture until a clear solution results, cool in running water, add 20 mils of ether, stopper the flask and shake until the ether has dissolved the salicylic acid. Then transfer mixture to a separatory, rinsing the flask with water. Then separate the aqueous layer containing the theobromine from the ethereal layer containing the salicylic acid. The theobromine solution is evaporated until dried and free from the odor of hydrochloric acid, the residue is made alkaline with ammonia, is transferred to a weighed filter paper, is cautiously washed with water, is dried and weighed. The salicylic acid solution is transfered to a tared flask, the ether is distilled off after which the residue is either weighed or titrated with tenth-normal alkali.—Z. Oesterr. Apoth. Ver., through Pharm. Zent., 61 (1920), 659.

O. P. A. H. Schaap gives the following methods for estimating the theobromine in diuretin. One gramme of the salt is dissolved in 5 mils of water and to the solution 300 milligrammes of ammonium chloride are added. The mixture, from which the theobromine separates at once, is warmed until the ammonia gas is expelled, and after allowing to cool is filtered. The precipitate is washed twice with 5 mil portions of water and dried at 100° C. to constant weight. One gramme of the salt is dissolved in 5 mils of water, to the solution 5 mils of a previously neutralized 10 per cent. solution of zinc sulphate are added and the mixture is carefully boiled for a few minutes. After allowing to cool, the precipitate is collected on a filter of 4 cm. diameter, is washed with cold water until free from sulphate and salicylate and is dried at 100° to constant weight. By multiplying the weight by 0.85026 the amount of theobromine is obtained.—Pharm. Weekbl., 57 (1920), 1234. (H. E.)

Vitamines.—*History of.*—Häussler offers a review on the history of vitamines and of the theories as to their chemical nature.

Tschirch's theory of the biological function of vitamines in building up the animal organism is as follows: The organism cannot, unaided synthesize from aliphatic amino acids such cyclic compounds as purin and pyrimidine bases, which are so essential in the formation of nucleic acids or cellular nuclei. The synthesis, however, takes place in the presence of enzyme like substances, "cyclo keiases," i. e., ring closers which are perhaps identical with vitamines themselves. —Schweiz. Apoth. Ztg., 58 (1920), 621 and 634. (H. A. L.)

Vitamines.—*Milk.*—Milk contains vitamines that tend to prevent scurvy in children. A. F. Hess has found that these valuable vitamines are quickly destroyed in milk which has been rendered alkaline by such chemicals as sodium bicarbonate and potassium carbonate. He attributes the infantile scurvy that he has observed in children fed on malt preparations to the alkali, potassium carbonate, which at times is used in these preparations. It has been suggested that infants should not be fed such a diet for too long a time, and, if the children are six months or more old, a desirable precaution is to give at the same time, orange juice and carrots.—Arch. Pediatrics, through Merck's Rep., 29 (1920), 4.

Vitamines.—L. C. Owen presents an valuable summary of our present knowledge of vitamines. He raises the interesting question as to whether vitamines are real matter or merely specific properties of certain material.—The Prescriber, through Am. J. Pharm., 92 (1920), 467.

Vitamines.—Under the title "If You Don't Get Vitamines You Can't Enjoy Good Health," Dr. F. A. Hawley, in a very comprehensive manner discusses vitamines chemically, physically and therapeutically.—Bull. Pharm., 34 (1920), 448. (C. M. S.)

Vitamines.—*Assay of*—R. J. Williams proceeds as follows: A known amount of the solution to be tested is added to 100 mils of a stock culture solution containing both asparagine and ammonium sulphate, and the mixture is made up to 110 mils and sterilized. One mil of freshly prepared suspension of yeast containing 0.3 gramme of fresh yeast per liter is added and the whole is incubated for 18 hours. A little formaldehyde is added to stop the growth, any

growth of wild yeast on the surface is skimmed off with a copper gauze scoop, and the yeast proper is collected in a Gooch crucible, washed with water and alcohol, dried at 103° for 2 hours and weighed. The weight of yeast produced minus that produced in a control is proportional to the amount of vitamine present. The results are expressed as the "vitamine number" of the material, which is the number of milligrammes of yeast produced by the addition of 1 gramme of the material.—J. Biol. Chem., through J. Soc. Chem. Ind., 39 (1920), 608A.

Vitamines.—*Nomenclature of.*—J. C. Drummond proposes to drop the final "e" of Funks' word vitamine. This removes most of the objections to the original term and classifies the substances as of undefined constitution. The various vitamines are conveniently referred to as vitamine A, B, C, etc.—Biochem. J., through J. Soc. Chem. Ind., 39 (1920), 798A.

Vitamines.—*Occurrence in Fruits.*—Osborne, Mendel, and Wakeman find that the fresh juice of the edible parts of the orange, lemon, and grape-fruit contain water-soluble B vitamine, being about equivalent in this respect volume for volume with cow's milk. Grape juice contains less of this vitamine. These juices may be suitably desiccated on starch without losing their efficiency. The edible portions of apples and pears furnish some water-soluble B, but from a comparative standpoint they cannot be regarded as rich in this factor. Prunes are somewhat richer than apples and pears. From preliminary experiments it is doubtful whether lemon or grape-fruit juice contains more than traces, if any, of the fat-soluble vitamine which, however, appears to be present in orange juice.—J. Biol. Chem., through J. Soc. Chem. Ind., 39 (1920), 609A.

Vitamines.—*Occurrence in Green Plant Tissues.*—Steenbock and Gross report that clover, spinach, alfalfa (lucerne), lettuce, cabbage, and chard contain fat-soluble A. Lettuce and cabbage are not as rich in this factor as the other plants, which is in accordance with the theory that this accessory factor is associated with certain yellow plant pigments. The water-soluble vitamine is present in alfalfa, clover, and cabbage in approximately the same amount.—J. Biol. Chem., through J. Soc. Chem. Ind., 39 (1920), 277A.

Vitamines.—*Rôle in Diet.*—The important rôle played by vitamines in nutrition is the subject of an article by Hinhede.

While in previous experiments where rats were used, the rats gradually died when fed on fat free food only; the writer used men for his experiments, and although their daily rations contained only 2.1 to 2.3 grammes fat they remained perfectly healthy.

Hinhede's conclusions are that as the food given the rats was vitamine-free, while the food given to the men (chiefly vegetable) was rich in vitamines, the latter must be an important factor in nutrition.—Pharm. Zent., 61 (1920), 372. (O. M.)

Vitamines.—*Stable Preparation of.*—Under the designation, "V," Dubin and Lewi have prepared a stable vitamine product, the basic constituent of which is a magnesium-calcium compound of inosite phosphoric acid. It contains 10 per cent. of calcium oxide, 15 per cent. of phosphorus, 3.5 per cent. of nitrogen, 2.5 per cent. of fat, 0.3 per cent. of iron, 5.6 per cent. of silicates, and 10 per cent. of moisture.—Am. J. Med. Sci., through Am. J. Pharm., 92 (1920), 752.

Vitamines.—*What Are They?*—A. Tschirch gives what information is at hand concerning vitamines. He inclines to the opinion that they are nitrogenous enzymes that are characterized by their ability to convert chained compounds into ringed bodies.—Schweiz. Med. Wsch., through Pharm. Zent., 61 (1920), 426.

Vitamines.—*Yeast.*—Myers and Voegtlin describe the separation of an active crystalline fraction from dried yeast. The fraction readily loses its activity.—J. Soc. Chem. Ind., 39 (1920), 500A.

Fat-Soluble Vitamine.—*Characteristics of.*—Whether and in what manner a dietary deficiency in fat-soluble vitamine plays a part in human disease remains to be ascertained. The probability of the need of this food accessory in the ration of man is large and the possible dire effects of a lack of it are being discussed widely at present, notably in relation to the pathogenesis of pellagra, rickets, and xerophthalmia in childhood. The fact that many fats, such as lard, vegetable oils and hydrogenated fats, which have found widespread use in the dietary of man in recent years, are virtually devoid

of fat-soluble vitamine has caused some concern owing to the relatively high cost of those fats, like milk fat, and egg fat, which are rich in it. It is a relief to know, however, that the fat-soluble vitamine has a far wider distribution in nature than the earlier studies led physiologists to suspect. Only recently the researches of McCollum, Steenbock, and their collaborators at the University of Wisconsin, and of Osborne and Mendel in New Haven, have indicated the richness of many sorts of plant tissues in all familiar types of vitamines, thus placing the dietary importance of "vegetables" in a new light.

Fat-soluble vitamine has never been isolated, nor has it been concentrated in any way which avoids the simultaneous presence of ordinary fats, to some extent at least. Although its reactions and behavior toward solvents suggest a lipoidal character, Steenbock and Boutwell have demonstrated that the fat-soluble vitamine resists saponification with alkalies whereby true fats are converted into soaps. Hence it can scarcely be regarded as identical with fats. This fact, for which some evidence had already been available, represents a distinct step in advance in the study of vitamine.

The extracts containing fat-soluble vitamine as obtained from natural products are invariably colored. Yellow corn is richer in fat-soluble vitamine than is white corn; there is a similar contrast between colorless lard and the yellow milk fat and egg fat. Hence, Steenbock has advanced the theory that the vitamine may be a yellow pigment, or, at any rate, a closely associated substance. His latest contribution is corroboratory; it also indicates that the vitamine attends the carotin rather than the xanthophyll variety of pigments, either or both of which may represent the yellow coloring matter in animal and plant foods. These findings, if they are further substantiated, mark a distinct step in advance toward the goal of discovering the nature of the fat-soluble vitamine.—J. Am. Med. Assoc., through Pharm. J., 105 (1920), 285.

Fat-Soluble Vitamine.—*Extraction from Carrots, Alfalfa and Yellow Maize.*—Steenbock and Boutwell find that alcohol is the best solvent to remove the fat-soluble accessory factor from these sources. Ether and other fat-solvents seldom give good results. The factor A appears to resist saponification in the cold and to be associated with the fraction containing the lipochrome, carrotene.—J. Soc. Chem. Ind., 39 (1920), 500A.

Fat-Soluble Vitamine.—*Occurrence.*—Drummond and Coward find that no hard and fast line can be drawn between animal and vegetable oils and fats when their value as sources of the fat-soluble vitamine A is considered. Certain vegetable oils, as for example, palm and yellow maize oils, are in the crude condition good sources of the vitamine. The presence of yellow lipochrome pigments, formerly believed to be an indication of the presence of the vitamine is now found unreliable for this purpose. The diet of an animal is an important factor governing the food value of the fat derived from that animal. Both animal and vegetable oils and fats tend to lose vitamine A on refining.

Nuts appear to be of little value as sources of fat-soluble vitamines.—Biochem. J., through J. Soc. Chem. Ind., 39 (1920), 798.

Osborne and Mendel report that the value of certain dried vegetables as sources of fat-soluble A is as high as that of butter-fat. Thus normal growth in rats may be obtained when the A vitamine is supplied in the form of 0.1 gramme of dried tomato daily. The liability of fat-soluble A to destruction by heat reported by Steenbock and others, and Drummond is not confirmed.—J. Biol. Chem., through J. Soc. Chem. Ind., 39 (1920), 422A.

Fat-Soluble Vitamine.—*The Thermostability of.*—Steenbock and Boutwell find that heating yellow maize, chard, carrots, sweet potatoes, or squash for three hours in an autoclave at 15 pound pressure caused no appreciable destruction of the fat-soluble factor. The process of ensilage was also without deleterious action. It is concluded that in plant tissues the factor is comparatively thermostable.—J. Biol. Chem., through J. Soc., Chem. Ind., 39 (1920), 798A.

Vuzine.—*Instability of Solutions of.*—Morgenroth and Abraham point out that vuzine and eucupine, like arsacetin, salvarsan, trypaflavin and optochin, are changed when in solution, so that by animal experimentation their respective actions are much lessened, even though in test-tube experiments their respective strengths appear unchanged. The authors, therefore recommend to physicians that solutions of these substances should be prepared freshly each day.—Dtsch. Med. Wsch., through Pharm. Ztg., 65 (1920), 289.

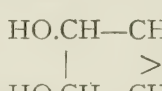
Vuzine.—*Use in Barbers Itch.*—C. A. Hoffmann finds that solutions of vuzine (1-2000) and novocaine-adrenaline (3 per cent.) injected percutaneously at the seat of the trouble, were of distinct value in barber's itch.—Dtsch. Med. Wsch., through Pharm. Zent., 61 (1920), 580.

GLUCOSIDES AND NEUTRAL PRINCIPLES.

Glucosides.—*Biochemical Study of.*—In 1901, when E. Bourquelot first introduced the biochemical method for detecting the presence of glucosides in plant tissue, the number of known glucosides which were hydrolyzed by emulsin was limited to ten. These were salicin, amygdalin, æsculin, syringin, arbutin, contaminated with methylarbutin, coniferin, gentiopicrin, salicinerein, and piccin. By means of the biochemical method the following fourteen new glucosides have been added to this group in the years indicated:—Aucubin, 1902; sambunigrin and prulaurasin, 1905; jasmiflorin, 1906; bakankosin and taxacatin, 1907; verbenalin, aleuropein and erytaurin, 1908; true arbutin, 1910; meliatin, 1911; hepatrilobin, 1912; loroglossin, 1919; and scabiosin, 1920. Besides these, the new polysaccharide, verbascose, was incidentally found in mullein root. In many instances these glucosides were found in several different species, sometimes in families very distantly related from the botanical point of view. Syringin, first found in lilac, is also present in various species of privet and of jasmin. Arbutin is present in all kinds of pears, in the leaves of *Pyrola rotundifolia, of Grevillea robusta,* and of *Hakea laurina.* Gentiopicrin, at first known only in *Gentiana lutea,* has been found in six other species of gentian, also in *Chlora perfoliata* and in *Swertzia.* Aucubin has been located in the genus *Garrya* and in the plantains. Prulaurasin of cherry laurel leaves occurs in the leaves *Cotoneaster microphylla.* Loroglossin has just been found in two other species of French orchids, besides in *Loroglossum hircinium.* In all, glucosides have been isolated from fifty-six species of plants. But this represents only a fraction of the number yet to be discovered. In the author's laboratory, up to the present time, 281 species of plants have been under investigation; of these 205 give indications of the presence of one or more glucosides. In fifty-six of these the glucosides have been isolated and identified. There remain, therefore, 149 for further identification. Since gluco-

sides are shown to be present in three-fourths of the limited number of phanerogamous plants hitherto examined, as there is every reason to suppose that they are equally of general occurrence in the unexamined species, it is obvious that an immense field of research has been opened up by the method. This general distribution of glucosides which can be hydrolysed by emulsin indicates that the part it plays in plant metabolism is not so unimportant as is sometimes assumed.—Comptes. rend., through Pharm. J., 105 (1920), 490.

Glucosides.—*Configuration of.*—Pictet has shown that levoglucosan is produced by the distillation of certain β-glucosides, but not from α-glucose. A considerable amount is, however, according to P. Karrer, obtainable from β-glucose, and the reaction is therefore conditional upon the presence of the β-configuration. Starch and cellulose, which answer to the reaction, probably contain β-glucosidic linkages, and it is possible that they contain the levoglucosan grouping. The structure of the trimethylglucose obtained by Denham and Woodhouse from cellulose suggests that the glucose residues in cellulose are coupled at the points indicated:—



—Helv. Chim. Acta, through J. Soc. Chem. Ind., 39 (1920), 348A.

Glucosides.—*Synthesis of High Molecular.*—Following the procedure of E. Fischer, S. Odèn prepared the following glucosides:

Tribromo phenyl glucosides: Tetra-acetate, tetrapropionate, tetralaurate, tetramyristate, tetrapalmitate, tetrastearate, tetrahexabromostearate, tetracerotate, tetrabromobenzoate and tetrabetanaphthoate.

Salicin glucosides: Pentacinnamate, pentaphenylpropionate and pentabromobenzoate.

Helicin glucosides: Tetracinnamate and tetrapalmitate.

Coniferin glucosides: Pentacinnamate, tetrastearate, heptabenzoate, heptachlorobenzoate, heptabromobenzoate, hepta-anisate and heptastearate.

Phloridzin glucosides: Heptabromobenzoate and heptapalmitate.

Alphamethyl glucosides: Tetra betanaphthalensulphonate, tetrabromo camphosulphonate and tetrapalmitate.

Raffinose glucosides: Hendeka benzoate, hendeka chlorobenzoate, hendeka palmitate, hendeka stearate and hendeka stearate.

Saccharose glucosides: Octocinnamate and octobromobenzoate.

Dulcitol glucosides: Hexachlorobenzoate and hexapalmitate.

Mannitol glucoside: Hexabromobenzoate.

Inositol glucoside: Hexabromobenzoate.

Formulas, melting points and optical readings of these bodies are given in the paper.—Ark. Kem. Min. Geol., through J. pharm. chim., *22* (1920), 309.

Glucosides.—*Synthesis of Purin.*—Continuing the work of Fischer and Helferich, Helferich and von Kuhlewein used the same method of synthesis with other sugars.

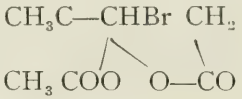
Without difficulty, theophylline galactosid and theobromine galactoside were obtained. As the purin glucosides found in nature by Levene and Jacobs were principally pentose derivatives it was of special interest to use this method with a pentose product. Levogyrate arabinose was selected and beautiful crystals of theophyllin-*l*-arabinose were produced.—Pharm. Zent., 61 (1920), 385. (O. M.)

Glucosides.—*Vacuum Distillation of.*—The distillate obtained from salicin consisted of an aqueous liquid containing a little furfural and a pasty mass from which levoglucosan, melting point, 179 to 180° $[a]_D^{20} = -66.73°$ in aqueous solution, was isolated. Similarly arbutin gave an aqueous portion containing acetic acid and furfural and a pasty mass from which levoglucosan and quinol were obtained, whilst phloretic acid, phloroglucinol, and levoglucosan were isolated from the semi-solid product from phloridzin. Pictet and Goudet suggest that the glucosides are in general derivatives of levoglucosan (thus accounting for their levo-rotary power) and not of dextrose, which is only formed as a secondary product of their hydrolysis in acid solution.—Helv. Chim. Acta, through J. Soc., Chem., Ind., 39 (1920) 40A.

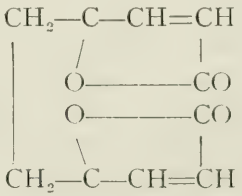
Amygdalin.—*Constitution of.*—Karrer, Nägeli and Lang find that hepta-acetylcellosidomandelic acid, obtained in small quantities by the interaction of inactive silver mandelate and acetobromocello-

biose is not identical with hepta-acetylamygdalinic acid, hence the corresponding non-acetylated acids are not identical, and the unknown disaccharide of amygdalin cannot be cellobiose; the β-glucosidic nature of the union of the disaccharide in the two cases is shown by the fact that hydrolysis is effected by emulsin in either case.—Helv. Chim. Acta, through J. Soc. Chem. Ind., 39 (1920), 800A.

Anemonin.—*Synthesis and Constitution.*—On distilling *Ranunculus sceleratus* with steam an acrid oil is obtained which has puzzled many investigators. Asahina and Fugita find that this oil contains protoanemonin, which represents one-half of the molecule of anemonin. In addition, the oil contains levulic acid $CH_3COCH_2CH_2COOH$, and from this substance, the authors have prepared bromolevulic acid, $CH_3CO\ CHBr\ CH_2COOH$, then acetyl bromolevulic acid,



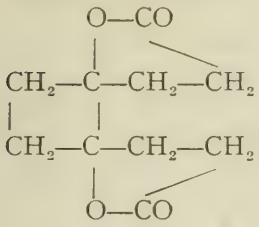
and from this, anemonin, was prepared. From this synthesis, the authors conclude that the formula of anemonin is:



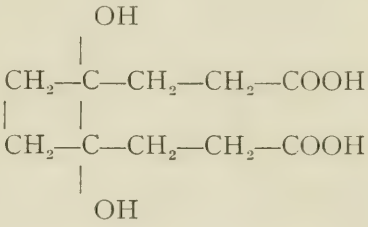
J. Pharm. Soc. Japan, through J. pharm. chim., *22* (1920), *22*.

Continuing Asahina's work on the structure of anemonin, he and Atsumi have studied the behavior of its tetra hydro-derivative and find that it yields on treatment with sodium ethylate, a salt, $Na_2C_{10}H_{14}O_6$, and that this salt upon oxidation in neutral solution by permanganate yields anemonolic acid. From this reactions, the authors deduce the following structural formulas:

Tetrahydro anemonin



The acid of $Na_2C_{10}H_{14}O_6$



J. Pharm. Soc. Japan, through J. pharm. chim., 21 (1920), 135.

Arbusterin.—*A New Phytosterol.*—G. Sani has isolated from the oil of the seed of *Arbutus unedo,* a crystalline phytosterin, $C_{26}H_{43}OCOCH_3$, melting at 129° and having the optical rotation—15.33°. In chloroformic solution, arbusterin gives with sulphuric acid a cherry color. Atti Accad. Lincei, through J. pharm. chim., 22 (1920), 312.

Beta-Gaultherin.—*Synthesis of.*—Karrer and Weidmann reports that upon the methylation of β-glucosidosalicylic acid with diazomethane, its methyl ester is obtained. Whilst structurally identical with natural gaultherin, it differs from the latter in that it is hydrolyzed by emulsin, but not by gaultherase. Gaultherin is, therefore, the α-stereoisomeride. Mauthener's product is identical with the tetra-acetyl derivative of the above ester, and is therefore not tetra-acetylgaultherin.—Helv. Chim. Acta, through J. Soc. Chem. Ind., 39 (1920), 348A.

Beta-Methylumbelliferon.—*Synthesis of.*—Arreguine and Garcia find that when 2 mils of concentrated hydrochloric acid containing a

small quantity of acetoacetic acid is boiled for a few minutes with the addition of 0.1 gramme of resorcinol, condensation occurs with the formation of β-methlylumbelliferone; the latter, after the mixture has been cooled and diluted, yields an intense fluorescence on the addition of a slight excess of ammonia. The reaction is not given by acetone or by β-hydroxybutric acid; it will detect as little as 0.00001 grammes of acetoacetic acid in 5 mils of urine.—Am. Chim. Analy. D., through J. Soc. Chem. Ind., 39 (1920), 279A.

Capsaicin.—*The Constitution of.*—E. K. Nelson in a second communication on this subject calls attention to the fact that since his first paper appeared, Lapworth and Royle have (See YEAR BOOK, 1919, 538), published the results of their work on capsaicin. These investigators are not fully disposed to accept Nelson's view of the constitution of capsaicin as final, on the ground that his conception of capsaicin as an acid amide is not easily reconciled with its somewhat ready reduction, its distinctly, basic character and its stability toward alkalies. They surmise that under the energetic conditions used by Nelson internal oxidation or molecular rearrangement would not be surprising.

In the present paper, Nelson gives proof of the structure of capsaicin by its generation from synthetic vanillylamine and decenoic acid previously isolated from capsaicin. The complete synthesis is impossible, he says, until we know the exact structure of the decenoic acid entering into the molecule. In view of the great number of possible isomers and the difficulty of locating the double bond in a substance of which only limited quantities are available, the structure of this decenoic acid must remain at present undetermined.

Nelson has confirmed the structure of capsaicin by its regeneration from vanillylamine and the decenoic acid isolated from capsaicin. Synthetic vanillyloctoylamide was found to resemble capsaicin closely in its stability toward boiling concentrated sodium hydroxide solution and in its solubility in concentrated hydrochloric acid.

The decenoic acid isolated from capsaicin, on fusion with potassium hydroxide, breaks down into acetic acid and an octoic acid with a branched chain.—J. Am. Chem. Soc., 42 (1920), 597. (J. L. M.)

Chlorogenic Acid.—*Structure of.*—According to Gorter chlorogenic acid is formed by the loss of a molecule of water from two molecules of hemichlorogenic acid. K. Freudenberg finds that this view is not readily reconciled with its fission by pencillium and mucor varieties or, as is now shown, by tannase into caffeic and quinic acids. Further, chlorogenic acid, which Gorter considered to be anhydrous contains 0.5 H_2O, thus accounting for the difference between it and the hypothetical hemichlorogenic acid. Chlorogenic acid is simply a depside of caffeic and quinic acids; the carboxy group of the former being united to one of the hydroxy groups of the latter as indicated by the formula:

$$C_6H_3(OH)_2.CH:CH.CO.O.C_6H_7(OH)_3.CO_2H.$$

—J. Soc. Chem. Ind., 39 (1920), 274A.

Coumarin.—*Production by Glucosidal Hydrolysis.*—While it has long been considered that the production of coumarin in plants some hours after cutting, is due to glucosidal hydrolysis, Bourquelot and Hérissey have now given the theory the proof of actual experimentation.

The freshly cut plant was boiled with water (to destroy the enzyme) the aqueous extract was distilled with steam, when little or no coumarin passed over. To the residue, diluted sulphuric acid was added and upon distillation an abundant yield of coumarin was obtained. Another part of the aqueous extract was distilled with steam, with negative results, and to the residue, powdered melilot was added and the mixture was boiled. Steam distillation yield little or no coumarin. To the residue more powdered melilot was added and after 48 hours of standing at laboratory temperature, the mixture was distilled with steam, when an abundant yield of coumarin was obtained.

In other experiments, the aqueous infusion was treated with invertin or with emulsin and the optical rotation was read from time to time and these readings showed the development of glucose by the hydrolysis of the glucoside.

The plants thus studied were *Melilotus officinalis, M. arvensis, M. lencantha, and Asperula odorata.*

From these experiments, the authors conclude that the glucoside contains coumarin, glucose and possibly some other carbohydrate.

The enzyme in the plants appears to be amulsin.—J. pharm. chim., 22 (1920), 289.

Digitalis Glucosides.—*Studies on the Pharmacology of.*—Thomas S. Githens describes briefly the chief constituents of digitalis. The two important glucosides, digitoxin and digitalein differ in solubility, absorbability and resistance to destructive agencies but their therapeutic action is much alike. The presence of from 16 to 20 per cent. of tannin is responsible for the disagreeable taste and the nauseating properties. Saponins add to the difficulty of extraction, for digitoxin is soluble in an aqueous solution of saponins though insoluble in water alone. Mr. Githens extracted powdered digitalis with chloroform, obtaining dixitoxin, chlorophyl, fixed and volatile oil, free fatty acid and coloring matter. After purification less than 2 milligrammes killed a 250 gramme guinea pig. To obtain the digitalein the marc left from the chloroformic extract was extracted with water or a mixture of alcohol and water up to 75 per cent. alcohol. The saponins can be separated from digitalein in alcoholic solution by means of ether. Pharmacodynamic studies showed digitoxin and digitalein to be qualitatively identical—an increase of blood pressure, a slowing of the heart, uncertain diuretic action, strong contraction of isolated uterus. Dr. Hatcher has found difference in absorbability from the digestive tract, digitoxin being readily absorbed, digitalein being poorly absorbed or largely destroyed. A mixture of the two administered by injection will give full effect, the sum of the separate activities. If the same mixture is given by the mouth full activity is exerted only by digitoxin. Variation in proportionate amounts of the two glucosides in the drug can cause great differences in effect, depending on whether it is administered by the mouth or hypodermically. Preparations containing only digitoxin are better for administration by the mouth, since it is irritating locally; and digitalein is better for hypodermic use for the reasons cited.—J. Am. Pharm. Assoc., 9 (1920), 1060. (Z. M. C.)

Gentianose.—*Enzyme Hydrolysis of.*—Bourquelot and Bridel report on a careful study of this hydrolysis. By polarimetric and by chemical methods the authors find that according to conditions, the hydrolysis may run in either of two ways:

I

(a) $C_{18}H_{32}O_{16} + H_2O = C_6H_{12}O_6 + C_{12}H_{22}O_{11}$
gentianose levulose gentioboise

(b) $C_{12}H_{22}O_{11} + H_{20} = 2C_6H_{12}O_6$
gentiobiose glucose

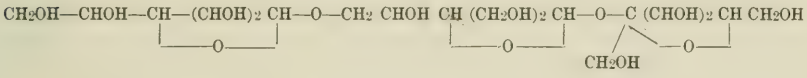
II

(a) $C_{18}H_{32}O_{16} + H_2O = C_6H_{12}O_6 + C_{12}H_{22}O_{11}$
gentianose glucose saccharose

(b) $C_{12}H_{22}O_{11} + H_2O = C_6H_{12}O_6 + C_6H_{12}O_6$
saccharose glucose levulose

Hydrolysis I is accomplished with invertase, while hydrolysis II is performed with gentiobiase.

The authors conclude that the structural formula of gentianose is:



—J. pharm. chim., 22 (1920), 241.

Loroglossin.—*Orchids that Contain.*—A crystalline glucoside obtained from *Orchis Simin,* and *Ophrys aranifera,* is shown by P. Delauney to be identical with loroglossin obtained from *Loroglossum hircinum,* by Bourquelot and Bridel.—Comptes rend., through J. Soc. Chem. Ind., 39 (1920), 672A.

Ouabain.—*Deterioration of Solutions of.*—Levy and Cullen, having observed wider variation in the potency of several lots of ouabain furnished in ampuls found that the sterilized solutions were decidedly alkaline in reaction, whereas freshly prepared aqueous solutions of the drug were neutral or slightly acid. Since ouabain (crystallized strophanthin) is readily rendered biologically inert by heating with alkali, the authors ascribe the deterioration of the solutions to alkali derived from the soft glass from which ampuls

are often made. The deterioration may be averted by the use of containers of hard glass.—J. Am. Med. Assoc., 74 (1920), 955. (W. A. P.)

Oxymethylanthraquinone Drugs.—*Assay of.*—After discussing the Tschirch colorimetric assay of these drugs, F. Daels recommends the following gravimetric method:

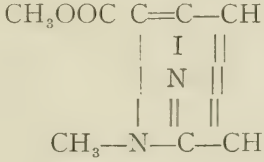
Two grammes of rhubarb are boiled for 15 minutes with 200 mils of dry chloroform in a 400 mil flask provided with an upright condenser, after cooling the chloroform is filtered off and the drug is returned to the flask and boiled for three hours with 25 per cent. sulphuric acid. After cooling the acid fluid is mixed with the chloroform extract in a separatory funnel, adding enough chloroform to bring its volume to 200 mils. There is then drawn off 150 mils of the chloroformic layer and this is shaken with 50 mils of a 10 per cent. sodium bisulphite solution after which the chloroform layer is drawn off, is mixed with infusorial earth, is shaken with 100 mils of 1 per cent. hydrochloric acid, after which the chloroform layer is separated and filtered. One hundred mils of the filtered chloroform (representing the oxymethylanthraquinones in one gramme of drug) are evaporated and weighed. By this method, Daels found that Shensi rhubarb contained 4.6 per cent. of oxymethylanthraquinones.—J. pharm. chim., 20 (1920), 316.

Picrotoxin.—*Constitution of.*—Hans Prillwitz has examined the decomposition of picrotoxinin by means of ozone with a view of throwing light on the constitution of picrotoxin. The paper is not suitable for abstraction, and the original should be consulted for details.—Arch. Pharm., through Pharm. J., 105 (1920), 510.

Pimpernella Saponin.—Vestlin reviews the work of Jalander leading to the discovery of a saponin in *Pimpinella saxifraga* and then describes the work done under Nyman at the University of Helsingfors which confirms the presence of this saponin, said to be the first ever found in plants of the umbellifera family. The rosolic acid test and hemolytic test having identified the saponin qualitatively, a quantitative analysis was made revealing 2.85 per cent. crude saponin or 1.07 per cent. pure saponin in the root. The molecular weight by the cryoscopic method was 620. Analysis of

the compound gave C=44.32%, H=6.73% and O=49.46% indicating the formula $C_{23}H_{36}O_{18}+2H_2O$, which would classify the saponin in the $C_nH_{2n-10}O_{18}+2H_2O$ series of Flückinger. In another test on a different sample of root the percentage of crude saponin was 2.39 per cent. and pure saponin 0.73 per cent., the molecular weight 644 and analysis C=44.1, H=6.83 and O=49.07 giving the formula $C_{23}H_{36}O_{18}+2H_2O$, which checks the first figures closely.—Pharm. Zent., 61 (1920), 77. (R. P. F.)

Ricinin.—*Structure of.*—Winterstein, Keller and Weinhagen discuss the constitution of this principle which is present in castor seed to the extent of 0.15 per cent., while etiolated young plants contain as much as 2.5 per cent. of ricinin. From a study of the relations between ricinin and ricinic acid, the authors conclude that the formulas of these former bodies is:



—J. pharm. chim., (1920), 147.

Salicarin.—*Use in Dysentery.*—Caille points out that the fluid-extract of *Lythrum salicaria* has for some time attracted attention in France as a useful astringent for the treatment of intestinal disturbances. The author has tried salicarin, the glucoside extracted from the plant, and has successfully treated three cases of bacillary dysentery therewith. Salicarin may be given in solution, or in tablets, in doses of 10 to 50 centigrammes. No secondary ill effects have been observed to follow the administration of large doses. The author is satisfied that salicarin is the therapeutic active principle of the drug; it produces the full effects of the liquid extract in much smaller doses.—Bull. gén. Therap., through Pharm. J., 104 (1920), 46.

Scabiosin.—From the roots of *Scabiosa succisa,* Bourquelot and Bridel have isolated, in addition to sucrose, a new glucoside, scabiosin, which on hydrolysis gives dextrose and a yellow sub-

stance insoluble in water.—Comptes rend., through J. Soc. Chem. Ind., 39 (1920), 312A.

Spilanthol.—Crude spilanthol was prepared by Asahina and Asano from air-dried flower-heads of the plant *Spilanthes oleracea*, by Gerber's method. The base, $C_4H_{11}N$, formed by heating it with alcoholic hydrogen chloride, proved to be isobutylamine. Hydrospilanthol, prepared by hydrogenating crude spilanthol in acetic acid solution in presence of platinum black, is a colorless viscous liquid which solidifies to crystals, melting point 28°. It is probably a mixture of two substances, $C_{13}H_{27}NO$ and $C_{14}H_{29}NO$. When heated with alcoholic hydrogen chloride in a sealed tube it yields isobutylamine and a saturated fatty acid, melting point 28°, and boiling point 136° to 140° at 4 mm.; probably a mixture of decoic acid, melting point 31.5°, and nonoic acid, melting point 12.5° C.—J. Pharm. Soc. Japan, through J. Soc. Chem., Ind., 39 (1920), 672A

Strophanthin.—*Pharmacological Action of.*—From the reactions between diluted solutions of strophanthin and colloidal gold solution or gelatin, Pietrokowski concludes that the pharmacological action of this glucoside may be a phenomenon of colloidal chemistry.—Biochem. Zsch., through Pharm. Zent., 61 (1920), 227.

Tannins and Depsides.—In a review of a posthumous book by Emil Fischer, the reviewer discusses the reports therein of Fischer's work on depsides and their relation to the tannins Depside is a word coined by Fischer to designate ester-like bodies produced by the condensation of two or more molecules of phenolcarbonic acids, the dehydration occurring between the phenol hydroxyl group of one molecule and the hydrogen of the carboxyl group of another molecule.

The simplest depside is that obtained from two molecules of paraoxybenzoic acid, $HOC_6H_4CO—OC_6H_4COOH$. Tannic acid U. S. P. is in turn the depside of gallic acid. Tri and tetra-depsides, condensation products of three or four molecules of phenolcarbonic acids, were also made by Fischer, and it is interesting to note that these synthetic depsides correspond to bodies extracted by Hesse from lichens.

These depsides condense with carbohydrates and thus Fischer produced a number of synthetic tannins, among them, hepta

[tribenzoyl-galloyl] para-iodophenyl maltosazone, $C_{220}H_{142}O_{58}N_4I_2$, molecular weight, 4021.—Pharm. Ztg., 65 (1920), 163.

Tannin Compounds.—*Use as Intestinal Astringents.*—On account of the irritant action of tannic acid on the stomach, a number of tannic acid compounds have been introduced which are assumed to pass the stomach practically unchanged but are broken up in the intestines with liberation of the tannic acid. Working in the A. M. A. Chemical Laboratory, P. N. Leech has made a study of the tannin compounds described in New and Non-official Remedies, and also of some recently introduced American products, to determine whether they are largely unchanged by action of gastric juice, and if so, whether they are capable of decomposition by the intestinal juice. For this purpose he determined the solubility of each compound in water and hydrochloric acid solution, acid and pepsin solution, and sodium bicarbonate and pancreatic extract solution. Only one type of tannic acid compounds studied completely resists the action of the gastric juice and is broken down in the intestine according to theory, i. e., the diacetyltannin acid compound, Acetannin. Tannigen is fairly satisfactory, but the market supply is not of reliable composition. Protan and tannoform are both readily soluble in sodium bicarbonate mediums, but they are probably not broken up to a great extent in the intestine. Of the tannin albuminates. Albutannin-Calco and Albutannin-M. C. W. are not nearly so resistant to the acid-pepsin digestion as tannalbin and tannin albuminate exsiccated. Both tannalbin and tannin albuminate exsiccated (the latter now sold as Albutannin-Merck) are not particularly resistant to the acid-pepsin medium, but they do liberate free tannic acid in the alkaline-pancreatic medium.—J. Am. Med. Assoc., 75 (1920), 1120. (W. A. P.)

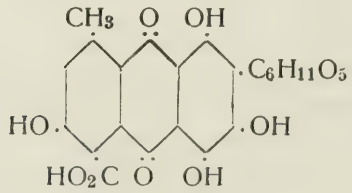
Ursone.—*Occurrence of.*—A. M. Nooyen found that all plants of the family Ericaceæ contain ursone, which is also present in various species of epacris, in crowberry and in four species of ivy. Ursone has the empirical formula $C_{29}H_{47}O.COOH$ forms a well crystallized methyl ester and crystallizable potassium and sodium salts. It does not possess a double bond nor does it contain hydroxyl, ketone aldehyde or methoxyl groups.—Pharm. Weekbl., 57 (1920), 112. (H. E.)

COLORING SUBSTANCES.

Anthocyanin Colors.—*Occurrence and Reactions of.*—F. Kryz report that members of the beet-red group of anthocyanins occur in the skins of fuchsia and cactus berries and in the petals of scarlet cactus blooms. Fuchsia anthocyanin gives a carmine solution in acidified acetone or amyl alcohol, but is insoluble in ether, chloroform, and carbon bisulphide. Cactus bloom anthocyanin is also insoluble in these media, but soluble in water, methyl, ethyl, or acidified amyl alcohol, and in glycerin. The coloring matter from red beet is soluble in cold acetone and similar to the others in its behavior towards reagents. Wing cactus blooms apparently contain two anthocyanins, since the reddish-yellow extract obtained with hot acetone shows slight differences from the foregoing compounds, whilst the aqueous solution of the residue exhibits close agreement. —Œsterr. Chem. Ztg., through J. Soc. Chem. Ind., 39 (1920), 442A.

Brasilin.—*Value in Microchemistry.*—J. Maras finds that the microchemical detection of iron is performed better with brasilin than with hematoxylin. The iron compound of brasilin dark brown, while cell nuclei are stained reddish-violet by it.—Compt., rend., Soc., Biol., through Pharm. Zent., 61 (1920), 226.

Carminic Acid.—*Structure of.*—Dimroth and Kämmerer find that the structure of carminic acid is:



In short, it is an anthraquinone body, possibly a derivative of oxyanthrapurpurin. While the $C_6H_{11}O_5$ group is of carbohydrate nature, the acid is not of glucosidal nature.—Ber., through Pharm. Zent., 61 (1920), 439.

Chlorophyll.—*Complexities of.*—J. U. Lloyd reprints an article entitled "Chlorophyll Complexities," published by him in 1876. To this he adds a postscript under date of 1919 pointing out that the chlorophyll problem is as complex as ever but that it is destined to be solved by colloidal chemistry. He then refers particularly to the affiliations of waxes, fats and oils with the chlorophyll molecule and discusses the difficulties in pharmaceutical manipulations brought about by these affiliations.—Am. J. Pharm., 92 (1920), 110.

Eosine-Methylene Blue.— *Preparing and Staining with.*—F. A. Beck has devised a method by which the stain may be prepared ready for use in less than an hour. He mixes 95. mils of methyl alcohol with 5. mils of N/10 sodium hydroxide in a 6-ounce bottle, and then adds an aqueous solution containing 0.47 grammes of yellowish eosine. When the latter is dissolved 0.40 gramme of methylene blue is added and the bottle shaken for thirty minutes. After filtration the filtrate is put into a glass stoppered bottle, ready for use.

For staining blood films the following four points are essential: 1, Thin film; 2, dry and cover preparation with stain for one minute; 3, rapidly drop water on stain until slide will hold no more; 4, at end of two minutes from the beginning, flush slide with water until it has a pinkish tint. Special instructions are given for staining leucocytes and erythrocytes as well as for pus, spinal fluid and throat smears.—Merck's Rept., 29 (1920), 54. (F. H.)

Indicators.—*Relative Value of.*—Mestrezat discusses the use of indicators, among them the following:

Poirrier blue. Not always satisfactory. Best results by use of 5 drops of a 1 per cent. aqueous solution to 100 mils of fluid being titrated.

Phenolphthalein. Excellent. Best results with 3 drops of a 1 per cent. alcoholic solution to 100 mils of fluid.

Sensitized tincture of litmus. Poor.

Lacmoid. Fairly good. Best results with 3 drops of a 5 per cent. aqueous solution to 100 mils of fluid.

Methyl orange. Useful. Best results with 2 drops of a 0.2 per cent. solution in diluted alcohol to 100 mils of fluid.

Sodium alizarin sulphonate. This indicator, recommended by Folin, gives excellent results. Best results with 3 drops of a 1 per cent. aqueous solution to 100 mils of fluid.

Alkaline carbonates should be titrated with methyl orange; ammonia with alizarin, lacmoid or methyl orange; phosphoric acid with alizarin.—J. pharm. chim., 21 (1920). 185.

Eosine-Methylene Blue.—*New Method of Dissolving,*—For dissolving eosine-methylene blue either methyl alcohol or ethyl alcohol are used. Since there was a scarcity of both alcohols in Germany, Hollborn recommends preparing a 1 per cent. solution of the dyes with warm glycerin. For staining microscopic preparations the product to be examined is first fixed either by heating for 3 minutes with methyl alcohol or for 30 minutes or longer with ethyl alcohol, then a few drops of a mixture consisting of 2 drops of the solution of the dyes diluted with 2 mils of distilled water are allowed to act on the preparation for 10 to 30 minutes. The excess of dye is then removed by washing with distilled water, the preparation is carefully dried and then covered with a neutral balsam.—Dtsch. Med. Wsch., through Pharm. Weekbl., 57 (1920), 333. (H. E.)

Fuchsin Dyes.—*Trypanozic Action of.*—M. Krause describes the beneficial effect of certain fuchsin dyes, such as the trypafuchsans and also certain safranin dyes, such as the trypasafrols in certain types of trypanozone diseases.—Z. phys. diaet. Therap., through Pharm., Zent., 61 (1920), 657.

Hematoxylin.—*Preparation of.*—Houseman and Swift describe a method and apparatus designed to produce hematoxylin in commercial quantities, about 100 grammes of pure substance being produced per day.—J. Ind. and Eng. Chem., 12 (1920), 173. (L. A. B.)

Indicator.—*Polychromatic.*—The indicator is 3.3′-dihydroxybenzaurine-2″-sulphonic acid (catecholsulphonphthalein), and is prepared by condensing catechol with *o*-sulphobenzoic acid. It

shows according to J. Moir, the following range of colors in acid and alkaline solutions:—Strong acid, purple-pink; $N/10$ acid, orange; $N/40$ acid, yellow; neutral, colorless or very faint green; just alkaline, violet; dilute alkaline, indigo-blue; strong alkaline, grass-green. —S. Afr. Assoc. Agric. Chem., through J. Soc. Chem. Ind., 39 (1920), 706A.

Indicators.—*Vegetable.*—Brubaker gives an account of twenty-five vegetable pigments which can be used as indicators. The coloring matter of *Rosa gallica* yields with alkalies a deep red color with a green fluorescence, which is turned to pink by acids. The coloring matter of *Rosa rugosa* is green in alkalies, red in acids and colorless in neutral solutions. The pigments are obtained by extracting an intimate mixture of the leaves of the flowers and sea-sand with 95 per cent. alcohol, filtering, evaporating the alcoholic liquid at moderate temperature and taking up the residue in water. Thus a pink-colored liquid is obtained. The coloring matter of *Lathyrus latifolius,* perennial pea, behaves with acids and alkalies the same as the pigment of roses. The same is the case with the pigment of blue flag, *Iris versicolor.*—J. Am. Chem. Soc., through Drug. Circ., 64 (1920), 141.

Insect Colors.—*Cause of.*—The cause of iridescence in insects etc., still remains unexplained. The minute structure of many iridescent bodies was investigated by H. Onslow because the most eminent physical authorities differed fundamentally as to the cause of their color. The great variety of structures described and illustrated show that each object must be judged on its own merits, because no general theory will explain all cases.

The principal type of color-producing structure found in butterflies has not hitherto been described. It consists of transparent plates of chitin separated by films of air. These plates are at right angles to the scale-surface, and are only a few half wave lengths in thickness. Their height, shape, and color together control the color-tone and saturation. Some butterflies have plates of chitin apparently parallel to the plane of the wing; others again show structures whose color cannot be explained.

Reasons are given showing the monochromatic transmission and reflection colors in beetles' scalps are probably not entirely due to

"gratings," as was proposed by Michelson. The chief objection to metallic reflection in the case of scales, are not met with in the wings of scaleless beetles. Here the color-producing layer is so near the surface that it would be difficult for any other adequate structure to exist. In certain beetles the color is produced by a thick layer of doubly refractive rods, such that sections tangential to the surface still retain their color. The wing chitin of golden "Tortoise Beetles" appears metallic at all depths, when moistened, but loses color when dry.

In other insects and some ticks, the color returns on wetting, apparently because there is a thin film, which, by absorbing water, becomes transparent, and can cause interference. Iridescence in dragon-flies, the eyes of flies, plants, and certain hairs, such as the Golden Mole, is also discussed.—Chem. News, 120 (1920), 83.

Methyl Red.—*Use as Alkaloidal Indicator.*—J. Herzog recommends methyl red as indicator in the volumetric assay of cinchona, belladonna, hyoscyamus, ipecac, nux vomica, opium and pomegranate and their preparations.—Apoth. Ztg., through Pharm. Ztg., 65 (1920), 647.

A. Eberhard endorses Herzog's views as to methyl red as an indicator. Eberhard finds that the use of ammonia as an alkalinizer in alkaloidal analysis is not advisable except in the case of belladonna and hyoscyamus. The ammonium chloride formed by the reaction passes over in small quantities into the chloroform—ether mixture, and thus converts the free alkaloid into its hydrochloride.—Pharm. Ztg., 65 (1920), 866.

Septacrol.—E. Forgues enthusiastically recommends this new antiseptic which is a double nitrate of silver and dimethyl-diaminomethyl-acridine, which is a red-brown hygroscopic crystalline powder, soluble in about 200 parts of water (quickly soluble when the water is warmed) and stable enough to stand the heat of 120° C. He has found it of great value in his practice in Senegal as an antiseptic in bubonic plague, septicemia, blenorrhagia and gonorrhea.—Bull. Soc. Therap., through J. pharm. chim., 21 (1920), 109.

ALBUMINOIDS.

Diiodotyramin.—*Action on Larva of Frog.*—J. Abelin claims to have obtained almost the same action on the metamorphosis of

the larva of the frog by the use of diiodotyramin, as is produced by using thyroid substance.

Feeding experiments with potassium iodide and lypiodin were negative.—Pharm. Zent., 61 (1920), 386. (O. M.)

Fibrin.—*Its Relation to Pharmacy and Medicine.*—Frederick Klein describes fibrin as a yellowish-brown, horny mass forming gelatinous solutions in acids and water. It is produced out of blood coagulum when fibrinogen is acted upon by the fibrin-ferment with the lime salts. Technically it is obtained when blood coagulum is vigorously beaten with a fish bone. This yellowish viscid mass is purified by washing with 5 per cent salt solution, water and then alcohol.

Fibrinogen and fibrin are chemically classed in the subprotein group called globulins which give certain reactions with salts and acid, after standing for hours. Klein then discusses the importance of it in the blood and different pathological conditions produced by tuberculosis, cancer and syphilis.—Pract. Drug., 39 (Apr., 1920), 32. (J. M. W.)

Histamine.—*A Decomposition Product of Albumoses.*—The proteoses of commerce vary in toxicity. A secondary albumose was prepared by T. Nagayama from fresh thyroid glands by means of peptic digestion. Under certain conditions hydrolysis with acids, causes the appearance of an appreciable quantity of histamine, and also of a histamine-like substance. Attention is called to the large amount of chloroform-soluble matter obtained in the hydrolysis of the proteoses studied.—J. Pharm. Exp. Ther., through J. Soc. Chem. Ind. 39, (1920), 673A.

Gelatin.—*Liquefaction by Salts.*—Briggs and Hieber finds that 5 per cent. solutions of gelatin in 33 per cent. potassium chloride solution set in 30 minutes at 19°; in similar solutions of magnesium chloride or ammonium chloride the solutions set in 24 hours, but in solutions of zinc chloride, potassium thiocyanate, potassium nitrate, or ammonium nitrate they do not set in 36 hours. The salt may be removed from the last group by dialysis and the gelatin then sets. The process of liquefaction and gelatinization by salts is strictly reversible.—J. Phys. Chem., through J. Soc. Chem. Ind., 39 (1920), 274A.

Iron Albuminate.—*Intravenous Injections of.*—C. Lüders strongly recommends in chlorosis, the intravenous administration of 0.5 gramme of solution of iron albuminate P. G. and 1.5 grammes of physiological salt solution.—Med. Klin., through Pharm. Ztg., 65 (1920), 492.

Kephalin.—*Glycerophosphoric Acid in.*—The presence of glycerophosphoric in kephalin has been established by Levene and Rolf, by the isolation and identification of that component. It is apparently identical with the acid found in lecithin.—J. Biol. Chem., through J. Soc. Chem. Ind., 39 (1920), 133A.

Keratin.—*Internal Use as a Hair Grower.*—Since hair has long been known to contain a relatively high percentage of cystin, and since keratin contains from 7 to 8 per cent. of this sulphur-containing amino-acid, the suggestion occurred to Dr. N. Zuntz, one of Germany's most eminent physiologists, that by administering hydrolysed keratin, the growth of hair on the animal body might be increased. Experiments are stated to have confirmed this theory. Commencing on himself, the professor found that whereas before beginning the treatment he grew a daily average of 5 milligrammes of hair on his head and face, and after taking from 1 to 2 Gms. of hydrolysed keratin every day for two months, his average daily production of hair rose to 922 milligrammes. Two youths who had become nearly bald were greatly benefitted by the keratin diet, and a colleague gave up the treatment because, under it, he had to shave twice a day. When tried on sheep, the treatment is claimed to have increased the wool production 1.74 times the original amount. Now a German firm has two preparations of hydrolyzed keratin on the market, one for human consumption, and the other to grow wool on sheep. While the author of this interesting and amusing communication is deeply respected, and his suggestion will be taken seriously and subjected to proof, a sceptical view may be taken. Almost any ordinary diet probably contains much more cystin than is required for the production of keratin that needs to be replaced. Secondly, in the number of recorded cases of cystinuria, where the wastage of cystin is very great, a deficiency of keratin formation does not seem to have been a noticeable feature.—Dtsch. Med. Wsch., through Pharm. J., 105 (1920), 323.

Protein Silver.—*Regeneration of Solutions of.*—G. Maue after describing four methods of removing protein silver from its solutions—by reduction, by oxidation, by precipitants and by thiocyanate method—recommends the following:

To a liquid containing 450 grammes of protein silver add 60 grammes of strong sulphuric acid previously diluted with 200 mils of water and then add a solution of sodium chloride (19:200). Allow the precipitate of silver chloride to settle, collect it on a filter, wash, dry and then fuse with alkaline hydroxide and nitrate.—Chem. Ztg., through Pharm. Zent., 61 (1920), 43.

Proteins.—*Color Reaction of.*—When a solution of proteins is shaken with sodium hydroxide solution and dimethyl sulphate and the mixture is underlaid with concentrated sulphuric acid, a purple ring is developed at the zone of contact of the liquid. The reaction is due to the presence of tryptophane in the protein, according to Edlbacher.—Z. physiol. Chem., through Drug Circ., 64 (1920), 64.

Proteins.—*Sulphurized Derivatives of.*—Sulphurized derivatives of proteins having therapeutic value may be produced, according to A. Pelliza, by condensing egg albumin, casein, etc., in the cold with carbon disulphide in the presence of sodium carbonate. The products are precipitated by dilute acid; and are purified by re-solution in alkalies and re-precipitation by acids. The sulphur content of egg albumin was by this method increased from 1.44 per cent. up to 3.75 per cent., the respective proportions of assimilable sulphur being 27.7 per cent. and 62 per cent.—Bull. Soc. Ind. Mulhouse, through J. Soc. Chem. Ind., 39 (1920), 500A.

Tyrosine.—*Assay with Millon's Reagent.*—A 1/50,000 solution of tyrosine to which Millon's reagent is added is used as a standard by M. Weiss. The solution to be examined is diluted until it gives with Millon's reagent a coloration equal to that of the standard. The method can be employed for the estimation of tyrosine in hydrolysed proteins.—Biochem. Zsch., through J. Soc. Chem. Ind., 39 (1920), 42A.

Yeast Protein.—*Medicinal Substances from.*—Yeast is liquefied by treatment with sodium chloride, thus obtaining the yeast protein. The latter is then colored with various basic organic dye-

stuffs, each possessing antiseptic properties. Methyl violet, auramines or safranines are preferred. The colored yeast protein is then heated to 125° by means of superheated steam, which treatment fixes the dyestuffs so that they are not removable by washing. The products finally obtained retain the antiseptic properties of the dyestuffs and have been employed with success for medicinal purposes, as disinfectants and as foods. The one containing methyl violet was found especially serviceable in the prevention and treatment of foot-and-mouth disease of cattle.—J. Soc. Chem. Ind., 39 (1920), 833A. (G. C. D.)

ENZYMES.

Enzymes.—*Chemical Nature of.*—E. Borkony estimated the alkylamino-nitrogen in a number of well-known enzymes by means of nitrous acid. The amino-nitrogen was found to vary from 3.05 per cent. in rennet to 7.66 per cent. in papayotin. The author considers that the results obtained are in favor of the theory of the protein nature of enzymes.—Biochem. Zsch., through J. Soc. Chem. Ind., 39 (1920), 795A.

Enzymes.—*Influence of Temperature on.*—A. Koenig finds that rennet and thrombin are more stable against high temperatures in concentrated solutions and in glycerol than in dilute solutions. The inactivation of rennet by heat may be delayed by increasing the quality of milk, as the latter contains protective substances. Increase in temperature up to a certain limit accelerates the action of rennet. The inactivating influence becomes evident only at 45°. The inactivation of pepsin and diastase also only becomes apparent at 45°. No difference as regards in activation by heat is observed in concentrated and in dilute solutions of pepsin. The different behavior of pepsin and rennet as regards inactivation by heat supports the theory that they are different enzymes.—Biochem. Zsch., through J. Soc. Chem. Ind., 39 (1920), 795A.

Diastase.—*Testing the Amylolytic Action of.*—Selman A. Waksman calls attention to the fact that the Lintner method for measuring the saccharogenic action of different enzymes upon starch should not be used for comparative studies of different enzymes, since the end products are not the same in the case of different enzymes.

Starch liquefying (iodine) methods (except that of Wohlgemutt) do not give the liquefaction of starch by enzymes, but measure arbitrarily the reduction of the starch substances giving no longer any reaction with iodine.

In the study of the action of enzymes upon the starches present or embodied in the textiles the Lintner method and its various modifications are unsuitable, since we are interested not in the sugar production, but in the starch elimination.

In the present work a method is described for measuring the starch liquefying power (amyloclastic action) of enzymes, which is practical and easily manipulated.

Comparing the starch liquefying powers of malt enzymes and enzymes obtained from *Aspergillus oryzæ* (water extract used known commercially as Polyzime) the first are found to give a higher Lintner value, while the second give a higher liquefying value. The ratio of the liquefying value to the Lintner value in the case of the malt preparations, is 1:4 to 1:5, while in the case of the enzyme of *Aspergillus oryzæ* it is 1:1 to 1:5, so that the liquefying power of the latter, in comparison to its sugar producing (saccharogenic power) is 4 to 6 times as great as that of the malt preparations.—Am. Chem. Soc. 42 (1920), 293. (J. L. M.)

Diastatic Activity.—Commercial starches which are used for the evaluation of malt substances contain many impurities which hinder the amylolytic activity of the diastase. Rosenblum conducted a series of experiments toward defining a standard "soluble starch" to be used in conjunction with a standard method of evaluation. He suggested adding a definite quantity of some amphoteric electrolyte which would ensure a constant acidity in the digesting solution. Asparagine and lactic acid were found effective, but the ammonium phosphates were effective and practical. Rosenblum, in summing up his work, states:

1. The difference in the hydrogen-ion concentration of starches due to the acid salts they contain render the estimation of diastatic activity by the digestion of starch uncertain.

2. When estimations are conducted by the Harrison-Gair method the diastatic power is at a maximum when the digesting solution has a faintly acid reaction to methyl red but is alkaline to methyl orange.

3. This condition may be secured by the addition of ammonium dihydrogen phosphate, and if 0.5 per cent. of the salt is added a constant acidity and, in most cases, an optimum activity are assured, and the difference due to the divergent reactions of different starches is neutralized.—J. Soc. Chem. Ind., 39 (1920), 311T. (M. O'C. D.)

Emulsin.—*Resistance to Action of Methyl Alcohol.*—In 1914, M. Bridel mixed together glucose, emulsin and 70 per cent. methyl alcohol; in 1920, the emulsin was filtered from the fluid and was found to have retained its hydrolyzing action, when tested on amygdalin, on salicin, on betabenzyl glucoside, and on betamethyl glucoside.—J. pharm. chim., 22 (1920), 323.

Gentiobiase.—*Hydrolysis of Gentianose by.*—M. Bridel reports on the simultaneous presence of these two carbohydrates in *Gentiana lutea, G. asclepiadea, G. punctata, G. cruciata* and *G. purpurea.* He ascribes the presence to the action of enzyme, *gentiobiase,* which at times acts hydrolytically, splitting gentianose into saccharose and glucose, and at other times effecting the synthesis of saccharose and glucose into gentianose.—J. pharm. chim., 21 (1920), 306.

Invertase. — *Experiments with.* — Van Euler, Hedelius and Svanberg report on their work with invertase (saccharase) as follows:

Several of the authors' invertase F-preparations were submitted to fractional dialysis through a collodion membrane. It was found that the carbohydrate content of the enzyme rose as the dialysis went on until a point was reached when it became stationary. The authors conclude that invertase must consist chiefly of carbohydrates. The nitrogen content of the dialysed invertase, on the other hand, diminished, and reached a limit rather higher than the one obtained by one of the authors in a previous investigation. These experiments show that invertase does not require a co-enzyme for its function.

Diffusion experiments with different invertase preparations have shown velocities of diffusion of varying magnitudes, and consequently the molecular weights calculated from these figures also showed significant variations. From the results obtained, which are given in detail, the authors conclude that the substrate and the prod-

ucts of the enzymic action do not diminish the size of the colloidal particles of the invertase. Neither is the velocity of diffusion influenced by the optimum acidity which is required for the action of the enzyme as compared with the reaction of pure water.—Z physiol. Chem., through J. Soc. Chem. Ind., 39 (1920), 636A.

Lipases.—*Castor and Soy Bean.*—Since 1900 there have been many investigations of the behavior of animal and vegetable lipases. These investigations have had a number of objects in view, such as the determination of the effect upon the lipase enzyme of media containing various salts, alkalies, acids and preservatives and the relation of lipase to a variety of substrates, including natural fats. There has been so much variation in the mode of attack used by different investigators that it is difficult to make comparisons between the results.

A. W. Barton studied a few of the properties of lipases of the castor and soy bean. The effect of increasing concentrations of acidity from the neutral point on the activity of the lipases was determined. The amount of enzyme in the two beans was compared, and the activity of the lipase on different subtrates, such as lard, olive oil and ethyl butyrate was estimated.—J. Am. Chem. Soc., 42 (1920), 620. (J. L. Mayer.)

Lipase.—*Hydrolysis of Oil by Castor Bean.*—J. J. Sudborough describes the practical work carried out by himself and his associates at the Indian Institute of Science in the hydrolysis of oils by use of castor oil lipase. He finds Nicloux method the most satisfactory and reports that under the climatic conditions of India, the production of glycerin by enzyme hydrolysis methods are distinctly successful. The chief drawback comes from the fact that the resulting glycerin contains some of the proteins of the castor bean, which are difficult to remove.—Chem. & Drug., 92 (1920), 978.

Papain.—*Action of.*—E. Pozerski finds that while at 95° papain loses its liquefying power at that temperature, it acts as a precipitant proteins from bouillon. On the other hand the presence in the bouillon of papain that has not been heated prevents the precipitating action of heated papain.—J. pharm. chim., 22 (1920), 74.

Papain.—*Uses of.*—In the course of a recent article on a papaw tree now in fruit in Kew Gardens, "The Times" mentions that papain has proved useful in diphtheria and eczema, and is used to remove freckles and (under the name of "melon bleach") stains from clothes. That prepared in Ceylon is said to be more powerful in action than that obtained in Montserrat, but has earned a bad name from the foolish adulteration with flour, and even with the dangerously acrid juice of another plant, which is practiced by the natives.—Chem. & Drug., 93 (1920), 1663.

Pepsin.—*Adsorption by Charcoal.*—Keefer shows by several interesting tests that our conception of the therapeutics of these two drugs, pepsin and charcoal, when administered together, has been without foundation. He bases his claim on the well-known adsorptive properties of charcoal. It is well known that bone black is used to bleach dark sugar juices, extract fusel oil from alcohol, and used in filtration in general to decolorize dark solutions. Any substance that causes a marked diminution of surface tension of water, such as fats, soaps, albumin, etc., is easily absorbed. Pepsin being an enzyme in combination with albumin it will readily give an albumin test, when the top layer of an acid solution is heated in a test tube over a flame. But if such a solution of pepsin is passed through a filter containing charcoal the filtrate will be found free of albumin. Since this adsorption of pepsin by charcoal is a very rapid process, it can be readily seen that pepsin-charcoal combinations, be they in tablet or capsule form, will as soon as moistened (in process of dissolving) begin the adsorption reaction. It is well known that charcoal has the property of not only absorbing the toxins developed from bacteria but of absorbing bacteria as well.—Am. J. Pharm., 92 (1920), 160. (J. K. T.)

Pepsin.—*Effect of Hydrogen Ion Concentration in Assay of.*—According to J. H. Northrup, the change of electrical conductivity during peptic digestion may be employed as a measure of the amount of pepsin present. The combination of pepsin with the substrate and the influence of the reaction of the medium of this combination, and hence on the rate of digestion, is discussed.—J. Gen. Physiol., through J. Soc. Chem. Ind., 39 (1920), 133A.

Pepsin.—*External Application of.*—L. Chenisse reviews the advantages of the external application of pepsin based on its property of dissolving the horny layer of the skin. The following formula has proved successful in the treatment of scar tissue, keloids, etc.:

Pepsin	10 grammes
Hydrochloric acid	1 gramme
Phenol, of each	1 gramme
Distilled water sufficient to make	200 grammes

This is applied in the form of a moist compress to the scar. To avoid irritation, set up by the presence of hydrochloric acid, 4 per cent. of boric acid can be substituted. This mixture also permits of the introduction of a number of drugs, and enables the cutaneous application of such substances as resorcin, pyrogallol sodium cacodylate, sodium bromide and iodide, arsenous acid, etc. It can be applied in the form of an ointment.—Presse Med., through Chem. & Drug., 79 (1920), 1283.

Pepsin.—*New Assay of Method.*—M. Bachstez states that during the war, the egg supply of Germany was so scarce that the official egg method of pepsin assay was scarcely feasible where many such determinations were required. Trying other methods, Bachstez found the Gross method (See Proceedings A. Ph. A. 56, 1908, 431) highly satisfactory and he now gives his modifications of the test as follows:

Into 6 test tubes are placed 10 mils of pepsin solution of the following pepsin content: (a) 0.02 gramme, (b) 0.01 gramme, (c) 0.005 gramme, (d) 0.0025 gramme, (e) 0.00125 gramme, (f) 0.00062 gramme. To each of these six fluids are added 10 mils of casein solution (Hammarsten-Kahlbaum caseinum purissimum, 1 gramme; 25 per cent. hydrochloric acid, 16 mils; water to make 1 liter) and the tubes and their contents are then heated in a water-bath between 38° and 40° for 15 minutes. After this digestion, to each test tube are added 20 drops of a 20 per cent sodium acetate solution and the six fluids are then studied as to clearness, turbidity or precipitation, that fluids in which no turbidity appears containing the amount of pepsin necessary to completely digest the casein present.

Performing this work with pepsin of the quality of the German Pharmacopœia (1 in 100) Bachstez found that 1 part of such pepsin digested 400 parts of casein.

The article gives details of comparative assays made with ten different samples of pepsin and its preparations.—Pharm. Zent., 61 (1920), 479.

Pepsin.—*Origin of.*—Pavlowsky's experiments lead him to the opinion that the spleen plays an important role in the formation of pepsin within the body.—Semana Med., through Am. J. Pharm., 92 (1920), 758.

Pepsin.—*Quality of.*—Funck and Möller find that the pepsin of German commerce contains dextrose, starch, dextrin, etc. They think that medicinal pepsin should meet the following requirements: Proper proteolytic activity; ash content, 4 to 6 per cent; solubility in water, with only slight turbidity; solubility in 0.2 per cent. hydrochloric acid with production of a clear solution and with no gas formation, solubility in 40 per cent. alcohol; low sodium chloride and acidity content.—Pharm. Zent., through Chem. Abstracts, 14 (1920), 1183.

Proteolytic Enzyme.—*Presence in Tumors and in Cancer.*—Loeper, Faroy and Tonnet find that cancerous tissue contain an enzyme, resembling erepsine, which breaks peptone into acid amines. They determine this by mixing glycerinic extract of the tumor tissue (or the serum of cancerous blood) with sterilized serum and 2 per cent. peptone solution and then apply the formal assay of acid amines to the mixture before and after standing in a culture oven for 48 hours.—Compt. rend. Soc. Biol., through J. pharm. chim., 22 (1920), 392.

Ricin.—*Detection in Press-Cake.*—Brioux and Guerbet state that a number of cattle have been killed through eating the press-cake from peanut oil factories, when the press-cake had become contaminated with castor oil seed. If the oil had been pressed from the whole seed, the microscope will easily detect the castor oil seed, the epidermal layer of which has a distinctive structure. If decorticated seeds have been employed the microscopical description

is less easy and the authors in such cases prepare an aqueous infusion of the press-cake, precipitate the ricin and other albuminoids by addition of ammonium sulphate, extract the ricin from the precipitate by dissolving in normal saline solution and then note whether this solution agglutinates blood. While peanuts contain no agglutinizing enzmye, like ricin, the press-cake from corn embryos, cottonseed, copra, poppy seed, colza and soya bean do; hence the test is of value only in the case of peanut press-cake.—Ann. falsif., through J. pharm. chim., 22 (1920), 394.

Urease.—*Amount in Soy Beans and Other Seeds.*—In an exhaustive article, D. H. Wester reports the results of a series of assays of 48 different seeds grown in Holland and of 49 different specimens of soy beans.

The seeds and beans were extracted with a 50 per cent glycerin solution and a 5 per cent extract obtained. Ten mils of this extract was then mixed with 10 mils of 2 per cent urea solution and 10 mils of this mixture titrated at once for correction. The balance was then titrated in quantities of 25 mils at intervals until conversion was complete. The amount of urease present was then calculated from the amount of urea converted.

The writer finds urease present in a number of seeds in varying quantities, but the soy beans contain the largest amount.

Another interesting fact is that two specimens of soy beans 17 and 31 years old, respectively, yielded a large amount of urease. The writer considers it unusual that an active enzyme be found in so old a drug.—Pharm. Zent., 61 (1920), 377.

Urease.—*Factors Influencing Reaction.*—Wester found that the action of urease in soy bean extract changes considerably when kept at 37°; thus he found that while the urea number (i. e., the number of milligrammes of urea converted by the urease solution) was 126 on the first day, after seven days' standing it had been reduced to 47 and after fourteen days to 38.2, and had increased after 21 days to 90, after 26 days it had decreased to 85, and after 35 days to 60.3.—Pharm. Zent., 61 (1920), 293. through Bot. Abs. (H. E.)

Wester further studied the conditions under which urea is converted into ammonium carbonate by means of soja bean enzymes.

A series of experiments were performed and proved that there is a distinct relation between the soja bean extract content of a solution and the amount of converted urea. The urea concentration, however, has little effect upon the activity of the extract. The enzyme is capable of converting large quantities of urea into ammonium carbonate. One can readily use an old extract provided it is made with glycerin as outlined, but the urea solution must be fresh. With glycerin solutions of 50 per cent or less one can make soja bean extracts which are as active as those made with water. The presence of glycerin during the reaction, however, hinders the effect. It is, therefore, recommended that small quantities of concentrated glycerin extract be employed. Tables of data resulting from the experiments are provided.—Ber. dtsch. Pharm. Ges., 30 (1920), 163. (H. H. S.)

Urease.—*Kinetics of.*—E. Yamazaki finds that urease from soya beans decomposes urea in two stages thus: $CO(NH_2)_2 \rightarrow NH_2CO_2NH_4 \rightarrow (NH_4)_2CO_3$. The reaction is retarded by the addition of electrolytes such as hydrochloric acid, silver sulphate, and mercuric chloride.—Sci. Rep. Tohoku Univ., through J. Soc. Chem. Ind., 39 (1920), 555A.

Urease.—*Properties of Soy Bean.*—In a study of a number of different varieties of soy beans, as to the urease activity, A. W. Dox reports that some difference exists, but that this difference appears to bear no relationship to the germinating power of the seed or the protein content of the latter. It was demonstrated that urease was in seeds that were practically dead. In regard to the best temperature to secure greatest activity, the author reports above 50° and probably below 60°.—Am. J. Pharm., 92 (1920), 153. (Bot. Abs.)

SERA AND VACCINES.

Antitoxin Protein.—*Concentration by Electric Current.*—W. G. Ruppel discusses the structure of albumin, its relation to globulin and also points out that there are two distinct types of globulin; the ordinary, which he calls *euglobulin*, and a form resembling both albumin and euglobulin, which he calls *paraglobulin*. He dis-

cusses the serum treatment of diseases and opines that such diseases mean the introduction into the blood stream of proteins foreign to the proteins existing in the blood of the individual affected. After describing immunizing methods, he points out that when neutral colloidal protein solutions are submitted to a current of electricity the protein molecules travel to the anode and there precipitate. The addition of alkalies speeds the transport to the anode, whereas, the addition of acids tends to transport the protein to the cathode.

His experiments show that when the electrolysis is performed in a vessel with porous compartments and when the protein solution is placed in the compartment, whereas the electrodes and the electrolyte are outside of the compartment, a separation of the various types of protein may be accomplished, and when the electrolyte and the potential is properly adjusted, the protein precipitate will consist chiefly of euglobulin, while the albumin and paraglobulin will remain in water-soluble form. The paraglobulin may then be separated from the albumin by a second electrolysis and by these means there may be obtained from diphtheria serum a highly concentrated form, since it has been proven that the antitoxin bodies are united with the paraglobulin rather than with the euglobulin and the albumin.

Ruppel claims that by this method he has prepared a concentrate, one gramme of which contains 2000 antitoxin units.—Ber. dsch. Pharm. Ges., 30 (1920), 328.

Colloidal Gold Test.—*Value of.*—Cruickshank confirms the colloidal gold test in diagnosing paralysis and syphilis. The paper reports his study of the possible albuminoidal constituents of the spinal fluid of paralytics and syphilitics, that may produce the coagulation of the gold.—Brit. J. Exp. Path., through Am. J. Pharm., 92 (1920), 834.

Hepatocatalase.—*Action of the Toxalbumins of Diphtheria.*—R. Thieulin describes the researches of Batelli and Stern, Iscovesco and Billard on the action of hepatocatalase and cites the view that this liver enzyme might combat through hemolysis, the toxalbumins of diphtheria. Thieulin's own work does not, however, encourage this hope.—J. pharm. chim., 22 (1920), 49.

Schick Test.—*Value of.*—This test, which can readily be applied to a large number of persons, makes it possible to differentiate those

immune from those susceptible to diphtheria. It also facilitates the attempt to increase the number of the immune by situable prophylactic toxin-antitoxin injections. By the use of the Schick test and toxin-antitoxin injections, institutions have been kept free from cases of diphtheria for years.—J. Am. Med. Assoc., 75 (1920), 545. (W. A. P.)

Toxins and Antitoxins.—*Mutual Precipitation of.*—Nicolle, Debains and Césari proceed as follows: The filtrates of the diphtheric and tetanic cultures are saturated with anhydrous sodium sulphate, the precipitates obtained being dried *in vacuo* over sulphuric acid and reduced to homogeneous powders. Then 0.8 gramme of the powder is dissolved in 10 mils of distilled water and mixed with an equal volume of a previously melted 10 per cent. solution of gelatin in "physiological water." The mixture is distributed in a number of test-tubes, 1 mil in each, and cooled in an ice chest. To these tubes in series is added 1 mil of the antitoxic serum at varying dilutions, 1/20, 1/50, 1/100, etc. After two hours at the ordinary temperature the tubes are examined, a positive result being indicated by the appearance of a white disc at the junction of the gelatin and the serum. It is important that the toxic solution and the serum should both be absolutely limpid. Antidiphtheric sera containing 300 units per mil and antitetanic sera containing 4000 units per mil both give positive results at a dilution of 1/50.—Comptes rend., through J. Soc. Chem. Ind., 39 (1920), 172A.

Tubercle Bacillus.—*Chemical Composition.*—By extracting 1,500 grammes of dry tubercle bacilli with chloroform, Goris succeeded in obtaining 7 grammes of a new substance, to which he gives the name of hyalinol. On treating it with a boiling solution of sodium carbonate it yields an odor resembling that of jasmin, and on extracting this solution with ether and drying, a small residue is obtained possessing a jasmin-like odor. The same solution on decomposition with hydrochloric acid yields a mixture of crotonic and isocrotonic acids, melting at 71°.—L'Union Pharm., through Pract. Drug., 39 (Nov., 1920), 301.

Vaccine.—*For Common Colds.*—There is no scientific evidence that common colds can be prevented by the use of vaccines, despite

the glowing recommendations of vaccine makers and the patter of the detail man. Colds characterized by catarrhal inflammation of the mucous membranes of the nose and the throat are caused by various organisms. The organism concerned in one epidemic is different from that in another. It is impossible to anticipate what organism is about to invade the household or community. Inoculation of mixed vaccines fails to produce immunity.—J. Am. Med. Assoc., 75 (1920), 1361. (W. A. P.)

Vaccine.—*For Dysentery.*—At a recent meeting of the French Academy of Sciences, Dr. Roux (director of the Pasteur Institute) presented a paper by M. Kabeshima, a Japanese bacteriologist, on an antidysentery vaccine. It appears that Dr. Hérelle, of the Pasteur Institute, while studying the "Shiga bacillus" (the microbe of dysentery is named after the Japanese savant who discovered it) found in the intestines of convalescents a microbe which passed through the finest filters, but which possessed the curious property of disintegrating Shiga bacilli. M. Kabeshima, having heard of Dr. Hérelle's discovery, employed the invisible bacilli as a vaccine against dysentery. His experiments on rabbits seem conclusive, and it is probable that the new vaccine will shortly be tried on human subjects.—Am. Drug., 68 (March, 1920), 130.

Vaccines.—*For Influenza.*—The *Medico-Military Review,* a semi-monthly mimeographed publication sent to medical officers of the Army by the Surgeon-General's Office, has the following on the use of vaccines against influenza: "YOU ARE REMINDED that so far a comprehensive analysis of results obtained by the use of monovalent and polyvalent vaccines in the prevention of influenza has not demonstrated their value. Much carefully controlled experimental work is now being carried out on this subject both in civil institutions and in the Army, and any worthwhile advances will be reported in the *Review* from time to time. If a prospective vaccine is developed, it will be prepared at the Army Medical School for general distribution and all medical officers will be duly notified. The general use of the present commercial polyvalent protective against influenza is not considered desirable. Numerous telegrams and other requisitions are being received for influenza vaccine. In view of the fact that no prophylactic influenza vaccine is available,

such requisitions should be discontinued."—J. Am. Med. Assoc., 74 (1920), 466. (W. A. P.)

Vaccines.—*The Prophylactic and Therapeutic Value of.*—G. W. McCoy reminds us that aside from the true "vaccines," smallpox and antirabic, the "bacterins" whose effectiveness is certain are limited. Trustworthy data show that typhoid fever has been eliminated from armies by systematic vaccination. Evidence points to the probable control of Asistic cholera and tropical dysentery. Vaccination against influenza has not been successful. There is no certainty as to the causative organism, a fact equally true of "colds." Therapeutic vaccines, "stock" and "autogenous" are beneficial in some forms of acne, in boils and in chronic pus infections. Some assert that the greatest value of vaccine treatment is psychological. It is significant that many of the best hospitals do not use vaccines for treatment. Vaccines unlike many remedial agents are relatively harmless.—J. Am. Pharm. Assoc., 9 (1920), 573. (Z. M. C.)

Vaccines.—*Use in Toxic Conditions.*—Under this title an article purporting to be a scientific contribution appears in the original department of the *Illinois Medical Journal.* The apparent purpose of the article is to overcome any hesitancy on the part of practitioners to use vaccines in toxic infectious conditions for fear that they might thereby cause harm. The theory propounded is contrary to those who have studied the subject. The man who writes the article, G. H. Sherman, is in the business of making and selling vaccines, though this is not made evident in the article.—J. Am. Med. Assoc., 75 (1920), 1140. (W. A. P.)

URINE, BLOOD, ETC.

Urinary Casts.—Louis Gerschenfeld gives a useful compilation of casts found in the urine. He describes, in detail, the characteristics of hyaline, waxy, granular, epithelial, fatty, blood, pigment, leucocyte, fibrinous, bacterial, calcareous, urate, spermatic and pseudo casts.—Proc. Pa. Pharm. Assoc., 42 (1920), 279.

Urine.—*Apparatus for Assay of.*—R. Weiss describes three appliances devised by him for the quick assay of urine.

Ammoniometer is a graduated cylinder into which is poured urine, tenth-normal alkali until phenolphthalein solution is just reddened, distilled water (which bleaches out the phenolphthalein color) and lastly tenth-normal alkali to a permanent red color. From the amount of alkali employed to bring the red color the second time, the amount of ammonia may be deducted.

Sulphatometer is a tube with tapering graduated bottom in which the sulphate precipitated as $BaSO_4$ may be read.

Indicanometer is a device for bringing about with ease, the blue indican reaction in chloroform, the quantity being determined by the amount of chloroform required to bring a blue color of standard intensity.

For details (including illustrations) the reader is referred to the original paper.—Münch. Med. Wsch., through Pharm. Zent., 61 (1920), 620.

Urine.—*Physical Examination of.*—C. Posner discusses the possible importance of certain physical factors as valuable data in the examination of urine. The viscosity, colloidal ingredients, size of drops, etc., are some of the points which might be of importance.—Ber. dtsch. Pharm. Ges., 30 (1920), 465. (H. H. S.)

Urine.—*Silica Spoon in Analysis of.*—J. B. Smith recommends the use of a silica spoon in urinary analysis. He remarks: "It is endowed with remarkable properties of standing heat without fracture. Although I have often poured water into it when hot and produced hissing, it is ever without fracture. Quantitative analysis of sugar with Fehling's solution, qualitative analysis of albumen, the acidity of urine, can all be determined in this small cuplet if attention be paid to *measured* drops, regularly delivered from a 1 mil pipette, or about 20 *measured* drops. I would draw attention, however, to the general application of the silica spoon, often superior to the platinum foil, and to the carbonization of a measured drop, or even less, of urine carbonized over a spirit lamp. Normal urine diluted to sp. gr. 1.001 with water will give a perceptible colored residue, seen with a blackish nuance when the clear glass-like spoon is held over white paper, whilst a sample containing only 0.2 per cent. sugar will afford a residue still darker, and, of course, such residue is still more so in samples of higher percentage.

It is quite possible in two or three minutes with a silica spoon and a spirit lamp to determine sugar, without reagents, from a droplet of urine corresponding to the tenth of a milligramme of sugar. A crucible lid of silica has also its special advantages, but it costs several shillings, whilst the silica spoon can be obtained for eighteenpence. The crucible lid should be mounted in a cleft wooden handle. I think apparatus of this material will speedily become universal."—Pharm. J., 105 (1920), 20.

Urine.—*Simplified Examination of.*—F. Dietze describes urine analysis with the reagents in the form of tablets. He finds the use of such tablets make the work of analysis much simpler.—Apoth. Ztg., through D-A. Apoth. Ztg. 41 (1920), 58.

Urine.—*Assay of Acetone in.*—Otto Mayer gives the following method for estimating acetone in urine depending on the conversion of the acetone into acetoxime with the aid of a hydroxylamine salt, according to the equation $(CH_3)_2\ CO+NH_2OH.HCl=(CH_3)_2C.NOH+H_2O+HCl$. To 100 to 500 mils of urine, 10 to 20 mils of 15 per cent. sulphuric acid and a few pieces of pumice are added and the mixture is distilled until 50 to 100 mils of distillate are obtained. As receiver an air-tight closed Erlenmeyer flask is used, which is protected from the access of atmospheric carbonic acid and ammonia vapors by being connected with two bulbs containing acid and soda lime. The receiver contains a solution of 0.5 to 1 gramme of a hydroxylamine salt in 20 to 30 mils of water, the solution having previously been neutralized against methyl orange. After allowing the distillate to stand for one hour, n/10 caustic soda solution is added until a neutral action is obtained. Then 10 to 20 mils more of caustic soda solution are added, and after again allowing to stand for one-half hour, the excess of alkali is titrated back with n/10 acid. Each mil of alkali corresponds to 5.906 milligrammes of acetone.—Zeitschr. physiol. Chem., through Pharm. Weekbl. 57 (1920), 1276. (H. E.)

Urine.—*Colorimetric Acetone Assay.*—Adler has devised a so-called *"acetonurometer,"* which consists of five tubes containing mixed solutions of neutral red, new blue and diamond phosphine having the exact tint of the Legal acetone test when applied to

dilutions containing 0.005, 0.01, 0.05, 0.08 and 0.1 per cent. of acetone respectively. Tubes of the same size to hold the urine samples and a suitable stand complete the apparatus.—Münch. Med. Wsch., through Schweiz. Apoth. Ztg., 58 (1920), 163.

Urine.—*Micro-Assay of Acetone in.*—Richter-Quittner suggests the following method in which 1 to 2 mils of urine and 1.5 to 3.0 mils of alkali need only be used. The urine is distilled once with steam in the presence of acetic acid and a second time with dilute sulphuric acid. Blood or plasma need only be distilled once, and instead of the steam, air is passed through the heated flask. The titration of the distilled acetone is carried out with $N/100$ iodine and $N/100$ sodium thiosulphate. One-tenth milligramme of acetone in 100 mils can be estimated with accuracy by this method. The quantity of urine and blood used must not contain less than 0.04 milligramme of acetone.—Biochem. Zsch., through J. Soc. Chem. Ind., 39 (1920), 206 A.

Urine.—*Assay of Albumin in.*—G. Pégurier proposes the following modification of the Méhu method: Triturate 10 grammes of colorless phenol crystals with 10 grammes of powdered citric acid and 20 grammes of 95 per cent. alcohol in a mortar until dissolved, and filter; to a convenient quantity of the urine add acetic acid drop by drop until the reaction to litmus is distinctly acid, and filter off 50 mils. Heat this in a beaker-flask until it just begins to boil, remove the source of heat, and add 5 mils of the phenol-citric acid reagent; rotate until the flocculent precipitate collects, filter through counterpoised double filter papers, wash with boiling water until the reaction is no longer acid, and then with ether-alcohol, dry at 100° and weigh, using the outer filter as counterbalance for the inner. The weight of the albumen multiplied by 20 gives the weight of albumin in a liter of urine. Urine that is highly albuminous must be appropriately diluted before acidification. The precipitation and washing are rapidly completed.—Rep. Pharm., through Pharm. J., 105 (1920), 250.

Ganassini and Fabbri proceed as follows: A rough estimate of the albumin content must first be made by boiling the sample of urine with sodium monophosphate and according to the amount of turbidity or precipitate produced, the accurate assay is performed

upon 20, 40, 50 or 100 mils of urine. In the accurate assay the urine is boiled with enough sodium monophosphate to make a 5 per cent. solution. The precipitated albumin is collected on a filter, washed and is then dissolved from off of filter paper with 10 to 20 mils of 10 per cent. alkali. To the alkaline solution of albumin is added lead acetate solution, the mixture is warmed on a water bath, is then cooled to 21° and is then titrated with tenth-normal iodine. Each mil of n/10 iodine=0.033 gramme of albumin.

The rationale of the process consists of the conversion of the lead salt by the protein sulphur into lead sulphide and the oxidation of this sulphide by iodine into lead sulphate.—Boll. chim. farm., through Pharm. Zent., 61 (1920), 646.

Urine.—*Comparative Albumin Assays.*—B. Wienss reports on thirty urine samples upon which he ran albumin assays: (a) by the Lenz gravimetric method; (b) with the Aufrecht albuminimeter; (c) with the Esbach albuminimeter. His results in tabulated form show that the Aufrecht method gives higher results than the gravimetric and that the Esbach figure is always higher than the Aufrecht, the ratio being approximately Gravimetric: Aufrecht: Esbach = 1.0:1.07:1.25. Whether the Esbach albuminimeter has a pointed or rounded bottom is also a factor.—Pharm. Zent., 61 (1920), 535.

Urine.—*Fallacious Albumin Tests.*—Schall points out that the sulphosalicylic acid test for albumin in urine is worthless, when the urine sample contains much calcium salts, as the latter will be thrown out by the reagent and the precipitate will be taken for albumin.—Münch. med. Wsch., through Pharm. Ztg., 65 (1920), 286.

Urine.—*Test for Albumin in.*—O. Mayer recommends to Scherer and Esbach test. He modifies it by preparing as his reagent a solution containing in 500 mils 10 grammes of mercuric chloride, 25 grammes of citric acid and 65 grammes of sodium chloride. This solution has the density 1.113, which is light enough to use it in overlayering dense specimens of urine. As a layering test, it is sensitive to 1 part of albumin in 100,000.—Südd. Apoth. Ztg., through Pharm. Ztg., 61 (1920), 298.

G. K. A. Nonhebel suggests the following simple protein test: Place in each of three test tubes 5 mils of clear, filtered urine. To the first add 5 mils of distilled water; to the second, 5 mils of diluted acetic acid; to the third, 5 mils of diluted acetic acid and 3 drops of potassium ferrocyanide solution. If the contents of the third tube are clear and that of the second cloudy, nucleo-albumin is present. If the contents of the third tube are cloudy, albumin is present. If the contents of both tubes are cloudy, both nucleo-albumin and albumin are present, in which even the fluid in the third tube will be more cloudy than that in the second tube. The test can be made more sensitive by the use of the nephelometric method, described on page 388.—Pharm. Zent., 62 (1920), 481.

Urine.—*Effect of Antipyrine in Diabetic.*—G. Maue observed that the dextro-rotation of diabetic urine suddenly changed into $\pm$ O°, and after a few days even a levo-rotation appeared. After investigation he finds that derivatives of pyrazolon often cause an inversion of the rotation. He points out the necessity of carrying out the qualitative test-tube reactions in addition to the polarimetric examination.—Pharm. Ztg., 65 (1920), 237. (C. P. W.)

Urine.—*Assay of Chlorides in.*—E. Votocek gives the following method for determining chlorine in urine: Ten mils of the urine are diluted in a beaker with 160 mils of distilled water, 5 mils of pure chlorine-free nitric acid and 6 drops of sodium nitroprussiate solution, obtained by dissolving 0.6 gramme of sodium nitroprussiate in 3 mils of distilled water, are added and then N/10 mercuric nitrate solution until an opalescent liquid is obtained. The opalescence should not disappear when allowing the mixture to stand for one or two minutes. One mil of N/10 mercuric nitrate solution corresponds to 0.005846 gramme of sodium chloride. The method can also be applied for the micro-estimation of sodium chloride in blood.—Chem. Ztg., through Drug. Circ., 64 (1920), 102.

Urine.—*Significance of Cylindroids in.*—In 81 cases of heart disease reported upon by Eigenberg, the urine of 36 of the patients showed cylindroids; apparently confirming the views of von Jaksch and Quensel, that cylindroids indicate disturbance of the renal circulation.—Zent. innere Med., through Am. J. Pharm., 92 (1920), 834.

Urine.—*Presence of Cystine and Cholesterin in.*—C. Pottiez reports on a sample of urine voided by a man of 58 years which deposited a sediment which upon examination proved to be cystine admixed with a small amount of cholesterol.—J. Pharm. Belg., through J. pharm. chim., 21 (1920), 288.

Urine.—*A Fallacious Diacetic Acid Test.*—Maxwell by personal experimentation has shown that the ingestion of sodium bicarbonate (as in hyperacidity) produces a urine that yields with ferric chloride a red color simulating the diacetic reaction.—Med. J. Australia, through Am. J. Pharm., 92 (1920), 598.

Urine.—*Presence of Diastase in Normal.*—Saigusa found that the urine of 114 persons responded to the Noguchi and Wohlgemuth diastase assay, the quantity recorded ranging from 8 to 64.—J. Am. Med. Assoc., through Am. J. Pharm., 92 (1920), 353.

Urine.—*Cause of the Diazo Reaction of.*—O. Furth has succeeded in isolating the principle giving the diazo reaction of certain urines. He finds it is a histidine derivative, that does not respond to the Millon reaction.—Biochem. Zschr., through J. pharm. chim., 21 (1920), 289.

Urine.—*Formic Acid in.*—W. Authenrieth reports that formic acid is a normal constituent of human urine, but the quantity of it changes with the individual. A full-grown person excretes about 280 milligrammes every 24 hours. Methyl alcohol is partially converted into formic acid in the organism. A full-grown man who had taken 80 grammes of methyl alcohol, well diluted, in the course of one week voided urine which contained only 5.2 grammes formic acid more than normal urine, which shows that only about 5 per cent. of the methyl alcohol is oxidized to formic acid. The maximum excretion took place on the third and fourth days. In toxicological cases a qualitative detection of formic acid in suspected cases of poisoning by methyl alcohol is of no importance. In the urine of persons who had taken methyl alcohol, Authenrieth never found formaldehyde but at times traces of the alcohol. Of 20 grammes of sodium formate administered to a person, 18 per cent. was recovered in the urine during two days.

Hexamethylenamine administered in doses of 2.5 grammes for 4 consecutive days neither increased nor decreased the amount of formic acid in the urine nor did the administration of lactic acid or dextrose. For determining the formic acid the following process was used: 300 mils of urine are distilled in a 750-mil flask with 30 mils of 20 per cent. phosphoric acid, adding to the liquid a few pieces of pumice in order to prevent bumping. To the residue in the distilling flask, 300 mils of water are added and the mixture is distilled again. This process is repeated until the distillate no longer reacts acid, which will be the case after about 1,200 to 1,500 mils have been distilled. The combined distillates are then mixed with an excess of calcium carbonate, previously rubbed into a paste with water, and the mixture is evaporated on a water bath until about 20 mils of liquid remain. This is filtered, to the filtrate 50 to 60 mils of a diluted mercuric chloride solution are added and the liquid is heated with occasional shaking for 5 to 6 hours on a water bath. Then 1 to 3 mils of 20 per cent. hydrochloric acid are added (the amount of acid varying with the amount of precipitate present) and the mixture is heated again for 20 minutes on a water bath. The calomel is collected on a tared filter or in a Gooch crucible, washed with water until the wash water no longer gives the reaction for chlorides, is then washed with alcohol and ether and dried at 100 to 110° to constant weight. By multiplying the amount of calomel found by .0977 the amount of formic acid is ascertained.—Arch. Pharm., through Pharm. Weekblad, 57 (1920), 773. (H. E.)

Urine.—*Assay of Minute Amounts of Glucose in.*—Goiffon and Nepreux treats the fluid with Fehling's solution, collects the cuprous oxide on glass-wool [or a Gooch crucible—Ed.] and after washing dissolves the oxide in a few drops of hydrochloric acid. Water is washed through the filter and to the total copper solution are added 2 to 3 drops of a saturated aqueous solution of tartaric acid, a few drops of 20 per cent. potassium ferrocyanide and enough water to make 50 mils. The red fluid is then compared colorimetrically with a standard copper solution similarly treated.

The method has been successfully used in the assay of glucose in the blood and in the rachidian fluid. Of course, the fluids have to be properly clarified before applying the test.—Compt. rend. Soc. Biol., through J. pharm. chim., 21 (1920), 357.

Urine.—*Improved Haines' Glucose Test.*—A description of a modification of the Haines glucose test, which shows the sugar when only 0.03 per cent. (the upper limit of the normal content) is present in the urine is published by Haines, Pond and Webster. The fact that it shows sugar only in abnormal amount while physiologic amounts are not shown renders it a more delicate test than the former method. The composition of the improved Haines solution is:

Copper Sulphate.....	5 Gm.
Glycerin	250 mils
Potassium Hydroxide.....	20 Gm.
(Or 14.3 Gm. of Sodium Hydroxide)	
Distilled water.....to make	1,000 mils

The copper sulphate is dissolved in a mixture of the glycerin and an equal amount of water with the aid of gentle heat. The potassium hydroxide should be dissolved in about 200 mils of water and added to the copper solution with constant stirring, the whole being made up to volume with distilled water. This solution keeps indefinitely, although with many of the specimens of glycerin now obtainable on the market a reduction may be observed. If, however, the solution be allowed to stand in a warm place for forty-eight hours, the clear supernatant fluid may be decanted or filtered from the precipitated cuprous oxide without impairing its delicacy. The solution is used in the same way as the former unmodified one, but a more beautiful and delicate reaction is obtained.

The authors have compared it with other methods and find it more practicable and generally useful. The following advantages are claimed for it: 1. The contact reaction is concentrated to a single plane, thus increasing its visibility. 2. Only one heating is necessary, and there is no long standing before reaction appears. 3. It will demonstrate pathologic sugar in amounts greater than 0.03 per cent. 4. It gives a clear-cut, decisive result in a minimum of time.—J. Am. Med. Assoc., through Merck's Rep., 29 (1920), 60.

Urine.—*Detection of Iodine in.*—When to urine containing iodine, hydrogen dioxide solution and a 1 per cent. alcoholic benzidine solution are added and the upper part of the mixture heated almost to boiling, the urine becomes brown to black colored and in the presence of larger amounts of iodine a black precipitate occurs, which is soluble in chloroform. Schumacher found that

normal urine under these conditions retains its color or is colored at most dark straw-yellow, and when the mixture is shaken with chloroform, the latter is colored only lemon-yellow.—Dtsch. med. Wsch., through Drug. Circ., 64 (1920), 217.

Urine.—*Detection of Magnesium Ammonium Phosphate in.*—H. Kunz-Krause states that the following reaction is specially suited to the detection of magnesium ammonium phosphate in urinary sediments, but may be applied to the detection of phosphates generally. The solution of the sediment in acetic acid is neutralized with ammonia. On addition of a drop of silver nitrate solution, an egg-yellow, cheese-like deposit of silver phosphate is formed which disappears on addition of a drop of ammonia. At the same time the magnesium ammonium phosphate is deposited as colorless, shining prisms united in the form of rosettes. The reaction may be applied to the detection of phosphates as cellular enclosures in plant tissues.—Ber., through J. Soc. Chem. Ind., 39 (1920), 767 A.

Urine.—*Assay of Mercury in.*—R. Fabre assays samples by first destroying the organic matter by boiling with hydrochloric acid and potassium chlorate and after the elimination of free chlorine by boiling and by passing sulphur dioxide through the fluid and removal of the sulphur dioxide by further heating, the mercury is precipitated by addition of stannous chloride. If the precipitated mercury weighs as much as 0.15 to 0.20 gramme, the globule is collected, washed with hydrochloric acid, water, alcohol and ether and is weighed after drying in a desiccator. If the amount is smaller ,a Gooch crucible is prepared with the asbestos impregnated with gold, by saturating with gold chloride solution and then calcining. This crucible and its contents after careful drying are weighed, the mercury residue is collected in the Gooch and after washing and drying it is weighed.—J. pharm. chim., 22 (1920), 81.

Autenrieth and Montigny after reviewing the rather complete literature on this subject, propose the following method: 500 to 1000 mils of urine are refluxed with 20 to 25 mils of strong hydrochloric acid and 5 to 15 grammes of potassium chlorate for five hours on a water bath, or for two hours on the free flame. The urine becomes colorless. The condenser is well washed with water

and to the liquid and wash water a slight excess of sodium acetate (for 20 mils of hydrochloric acid 35 grammes of the crystallized salt) and 20 to 30 milligrammes of zinc chloride are added and hydrogen sulphide gas is conducted into the solution for one half hour. By adding the zinc salt, the mercury sulphide is precipitated quantitatively together with the zinc sulphide. After allowing the mixture to stand for several hours, the precipitate is collected in a Gooch crucible and washed several times with water saturated with hydrogen sulphide. The precipitate is then transferred to a porcelain dish, which contains 5 mils of diluted hydrochloric acid and a few crystals of potassium chlorate, and after solution has taken place, the excess of chlorine is expelled or removed by adding a small amount of alcohol. The clear liquid is then filtered into a graduated cylinder. The filtrate is washed well with hot water until 10 to 20 mils of liquid are obtained. Eight mils of clear filtrate are then mixed in a 10 mil graduated cylinder with one mil of a clear 1 per cent. gelatin solution and one mil of hydrogen sulphide water. The mixture is well shaken and after allowing to stand for 3 to 5 minutes, the color produced in the mixture is compared with those obtained by treating mercuric chloride solutions of known strengths treated as just given. The gelatin added in the process acts as a protective colloid, keeping the mercury sulphide in colloidal solution. This method cannot be used when other metals such as lead, copper, silver, bismuth and tin are present, which give a brown color with hydrogen sulphide.—Muench. Med. Wsch., through Pharm. Weekbl. 57, (1920), 1113. (H. E.)

Urine.—*The Methylene Green Reaction of.*—Some samples of urine react with methylene blue with a rapid conversion of the blue color to green. E. Boit discusses the reaction in detail, pointing out that the test is best conducted by adding to 5 mils of the urine, 5 drops of a methylene blue solution, 1 in 1000. He states that the reaction occurs in urine from tuberculous patients, who are approaching their end.—Münch. Med. Wsch., through Pharm. Zent., 61 (1920), 133.

Urine.—*Presence of Mucin in.*—C. O. Guillaumin, finding that many classic works on urology claim that mucin is never present in urine, proves that the statements are erroneous by describing in

detail two samples of urine in which mucin was undoubtedly present. —J. pharm. chim., 21 (1921), 337.

Urine.—*Detecting Picric Acid in.*—Utz precipitates biliary pigments from the urine with lead acetate, removes the surplus lead from the filtrate by addition of sulphuric acid and then shakes out the second filtrate (which is intensely yellow if picric acid is present) with ether. The ethereal extract is evaporated and the picric acid in the residue is detected by the usual tests for that substance.—Süddtsch. Apoth. Ztg., through Schweiz. Apoth. Ztg., 58 (1920), 162.

Urine.—*Detecting Radium in.*—In order to ascertain whether or not radium salts are retained in the organism for any length of time Klein made a series of experiments to detect these salts in the urine, finding that they are only very difficultly eliminated and exert their action for days and even weeks. When to 4 mils of the urine are added 4 mils of a solution of silver chloride in hydrochloric acid, obtained by adding to one mil of a 5 per cent. silver nitrate solution, sufficient strong hydrochloric acid to dissolve the silver chloride, urine containing radium is colored violet, while normal urine remains uncolored.—Apoth. Ztg., through Drug. Circ., 64 (1920), 21.

Urine.—*Presence of Difficultly Reducible Sugars in.*—D. Berg thinks that samples of urine where the Trommer reaction gives a greenish yellow precipitate instead of the brick-red precipitate of cuprous oxide, contain a slowly reducible sugar, possibly the substance described by Leo.—Dtsch. Med. Wsch., through Schweiz. Apoth. Ztg., 58 (1920), 162.

Urine.—*Determination of Small Amounts of Sugar in.*—Kowarski can assay the sugar in as small an amount as 0.1 mil of urine or 0.35 mil of blood by adding the fluid to Fehling's solution, collecting the precipitated cuprous oxide, adding it to an acid ferric sulphate solution and finally determining with permanganate the amount of ferrous salt produced by the cuprous oxide.—Dtsch. Med. Wschr., through Schweiz. Apoth. Ztg., 58 (1920), 161.

Urine.—*Tyrosinases in.*—O. Gross points out that there are two oxydases, phenolases and tyrosinases, that oxidize bodies with the formation dark-colored compounds. The tyrosinases thus blacken tyrosin, phenolanine, homogentisinic acid and adrenaline. Such enzymes were found by Gross in a sample of urine from a patient suffering from liver trouble.—Deutsch. Med. Wsch., through Pharm. Zent., 61 (1920), 132.

Urine.—*Urea Assays of.*—Ivor Griffith recites the technic and results of a number of experiments to determine the relative accuracy of the various methods used in making a quantitative determination of urea in urine and presents the following conclusions:

1. The colorimetric (Denis and Folin) method using urease is practically perfect.

2. The urease method of Marshall is next in order of accuracy.

3. The sodium hypobromite method shows fairly high results with urine probably because nitrogen is liberated from sources other than urea. This occurs even with using various concentrations of caustic soda.

4. The hypobromite method with careful technic is not too "notoriously" inaccurate for routine clinical work, but is not nearly accurate enough for detailed scientific work.—Proc. Penna. Assoc., 43 (1920), 258. (L. S.)

Frenkel strongly recommends the xanthydrol method devised by Fosse as being readily carried out and much more accurate than the hypobromite method, which is at best quite approximate. The reagent is a 1 in 10 solution of xanthydrol in methyl alcohol, and the urine should be adjusted to contain from 1 to 2 grammes of urea in a liter. The determination is carried out as follows: Dilute 10 mils of the urine to 100 mils; add 35 mils of glacial acetic acid; then add at intervals of ten minutes 5 × 1 mil of the reagent, rotating each time; set aside for an hour, filter, wash with 20 mils of 95 per cent. alcohol in small portions, dry at 100°, and weigh. The weight divided by 7 gives the weight of urea.—Am. Chim. Anal., through Pharm. J., 105 (1920), 250.

Urine.—*A New Ureometer.*—P. Bobay described the instrument illustrated below (Fig. 25). It consists of an upper, ureometer tube (G) into the lower end of which is ground (along 12 centimeters of surface) a lower tube (P). At the opposite ends of the two tubes are stopcocks and graduated funnels, the funnel of tube G opening into a narrow tube fused into the center of the ureometer tube.

In using the apparatus the two parts are fitted together with mercury added to make the joint (Hg). The apparatus is then held in the left hand with funnel A pointing downward and after opening the stopcocks, the apparatus is filled with water through funnel B. Then through B is passed successively the solution containing urea, a few drops of alkaline solution and freshly prepared hypobromite solution. After agitation the apparatus is reversed, the level of the liquid in inner and outer tube of part G and the amount of gas is then read off.—J. pharm. chim., 21 (1920), 62.

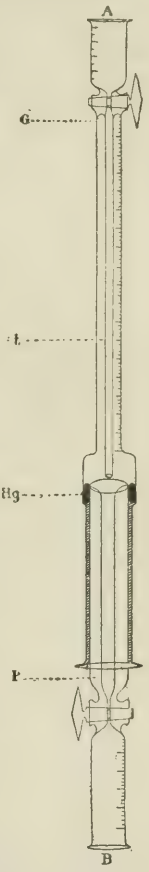


Fig. 25.

Yvon Ureometer—*Simple Method of Graduating.*—C. O. Guillaumin discusses the equalities of graduation of these instruments as they come from the dealer and the importance of checking them up for errors. He describes a method of determining the accuracy of the graduations, which consists principally of filling the ureometer with water, attaching the lower end by tube with a standardized pipette or burette with water level at its lowest graduation and then by cautious opening of the upper stopcock of the ureometer admitting the air little by little, comparing the rise of the water in the burette with its fall in the ureometer.—J. pharm. chim., 21 (1920), 342.

Urine.—*Detection of Uric Acid in Precipitates from.*—M. Weiss points out that a simple way to tell whether a precipitate from urine is uric acid is to add to the sample, drop by drop, a 1 per cent. permanganate solution. If the sediment consists of uric acid

it will dissolve (with decomposition) and the urine sample will become clear.—Münch. Med. Wsch., through Pharm. Zent., 61 (1920), 471.

Urine.—*Vitamines in.*—G. Gaglio demonstrated the presence of vitamines in urine by curing pigeons afflicted with polyneuritis by administration of small amounts of that fluid.—Policlinico, through Chem. Abstracts, 14 (1920), 3700.

Urine.—*Assay of Zinc in.*—A. Weitzel reports that when zinc is assayed by destroying the substance under examination in the usual way by ignition and precipitating the zinc either by ferrocyanide of potash in the acid solution of the ash or by precipitating the metal (after rendering the acid solution alkaline with sodium hydroxide and then acidulating the liquid with acetic acid, with hydrogen sulphide) only very small quantities of zinc are removed from the glass containers. In those cases where the substance is boiled with strong caustic alkalies or with phosphoric acid or where fluorides are applied in acid solution, larger quantities of zinc are liable to be taken out of the glass containers and zinc-free glass therefore should be used.—Arb. a. d. Reichsgesundheitsamte, through Pharm. Weekblad, 57 (1920), 350. (H. E.)

Uric Acid.—*Assay—in Urine and Blood.*—After reviewing the rather comprehensive literature on this subject and criticizing a few methods used at the present time, Miss G. Jongbloed offers the following method. The urine is rendered amphoteric toward litmus with sodium carbonate and in 2 mils, 600 milligrammes of ammonium chloride are dissolved and the solution is centrifuged for 3 minutes. The supernatant liquid is then poured off, to the residue 4 mils of a 10 per cent. ammonium sulphate solution are added, the mixture is centrifuged again and the supernatant liquid discarded. This process is repeated three times. The residue is then dissolved in about 5 mils of a hot 0.4 per cent. lithium carbonate solution, the liquid is transferred with the aid of water to a 100-mil graduated flask and to the liquid 4 mils of a phosphotungstic reagent, 20 mils of a diluted sodium carbonate solution and sufficient water to obtain 100 mils are added. The blue color produced in the liquid is then estimated colorimetrically by comparing it with those obtained by

treating uric acid solutions of known strengths in the same way. If the urine has a specific gravity higher than 1.020 it should be diluted with an equal volume of water, and if urates should have separated these should first be dissolved by diluting and heating the urine. For the estimation of uric acid in blood, this should first be deprived of the albumin. Ten mils of blood are received in 1 per cent. potassium oxalate solution, to the mixture water is added and the liquid after the addition of a few drops of 5 per cent acetic acid is boiled until it has become clear. The mixture is then filtered, the filtrate is evaporated to about 1 mil, taking care that the liquid always remains acid by adding from time to time one drop of a 50 per cent. acetic acid. The residue is then neutralized with a 0.4 per cent. lithium carbonate solution and with the aid of water is transferred to a centrifugal tube. The total volume of liquid should not exceed 2 mils. In the liquid 600 milligrammes of ammonium chloride are dissolved, the solution is allowed to stand for 24 hours at 15°, the precipitate is separated by filtration, washed repeatedly with a 10 per cent. ammonium chloride solution, is then dissolved in a hot 0.4 per cent. lithium carbonate solution and the resulting liquid is then treated in the same way as the uric acid solution obtained from urine. The phosphotungstic reagent is obtained by heating 100 grammes of sodium tungstate, 212 mils of 25 per cent. phosphoric acid and 558 mils of water for several hours, allowing the mixture to cool and then adding sufficient water to obtain 1000 mils.—Pharm. Weekbl. 57 (1920), 655. (H. E.)

Urochrome.—*Preparation and Properties.*—This pigment, is obtained by treating the urine with animal charcoal, which absorbs it, washing it with cold water to remove other urinary constituents and then extracting the color from the charcoal by treatment with 50 per cent. alcohol containing 0.5 per cent. of sodium hydroxide. The solution is neutralized with sulphuric acid, is concentrated and after the sodium sulphate has crystallized out, the mother liquor is mixed with alcohol and the precipitated urochrome is then washed with ether and is dried in vacuo. According to Mellanby and Thomas, urochrome is an amorphous, dialyzable brown powder very soluble in water and insoluble in ordinary solvents.—J. Physiol., through J. pharm. chim., 22 (1920), 439.

Urorosein.—J. Atlee Dean summarizes his paper in these words: "Indican (indoxyl-potassium sulphate) is not the only product of intestinal putrefaction of proteins. Urorosein is of equal or even greater significance. The reporting of no excess of indican without testing for urorosein is not only a serious omission in a complete urine analysis, but misleads because it suggests no intestinal intoxication."—J. Am. Pharm. Assoc., 9 (1920), 252 (Z. M. C.)

Urea.—*Detection of.*—According to Beijerinck urease can be detected in cross-sections of plants by means of a gelatin plate which contains 2 per cent. of urea and an aqueous extract of yeast. In this test, the urease converts the urea into ammonium carbonate, which diffuses through the gelatin and produces a beautiful rainbow effect, the Newton's rings. Calcium carbonate and calcium phosphate are deposited from the yeast. In the absence of yeast, a plate containing 2 per cent. agar, 2 per cent. urea and a small amount of phenolphthalein may be used. By reversing the reaction, urea can be detected in liquids such as urine, water, etc., according to J. F. A. Pool. A small amount of the liquid is neutralized against phenolphthalein and boiled with about 2 per cent. of agar. The mixture is transferred to a watch crystal and a cross section of a soy bean is placed upon the surface of the jelly. If as little as one milligramme of urea is present in one mil of the liquid under examination a red color will be developed.—Pharm. Weekbl., 57 (1920), 178. (H. E.)

D. Ganassini states that Schiff's color reaction for the detection of urea by means of furfural is given only if the latter contains acetone as impurity. The reaction is given also by allantoin, biuret, and urethane, the color tending to violet with the last compound. It is rendered very sensitive as follows: A drop of the liquid to be tested is placed on a microscope slide together with a drop of concentrated nitric acid; in presence of urea, colorless overlapping rhombic or hexagonal crystals of the nitrate separate. When exposed to the vapors from a mixture of equal parts of furfural and acetone the crystalline residue, if it is urea nitrate, becomes colored more or less intense reddish-violet, while under the microscope the crystals are seen to be undergoing solution and to be surrounded

by a pink halo.—Boll. Chim. Farm., through J. Soc. Chem. Ind., 39 (1920), 278 A.

Urea.—*Decomposition with Nitric Acid.*—T. W. Price states that the reaction between urea and nitric acid is unimolecular, and as the products consist entirely of carbon dioxide and ammonium nitrate it is analogous to the decomposition of urea by hydrochloric or sulphuric acids and proceeds according to the equations:

$$(1)\ CH_4N_2O+HNO_3=NH_4NO_3+HNCO.$$
$$(2)\ HNCO+H_2O+HNO_3=NH_4NO_3+CO_2.$$

As the velocity diminishes with the concentration of nitric acid it appears that only free urea, and not its nitrate, takes part in the reaction (1) above. According to the dissociation theory of the decomposition of urea, whereby ammonia and cyanic acid are supposed to be the primary decomposition products, the addition of a salt containing an ammonium ion should have a retarding influence on the decomposition, but the reverse was found to be the case, and hence it appears that this theory is not applicable. The decomposition velocity is small below 80° C., and at 30 to 40° is negligible, and hence the use of urea to remove nitrous acid from nitric acid will not be accompanied by a loss of nitric acid at low temperatures. —Chem. Soc. Trans., through J. Soc. Chem. Ind., 39 (1920), 131 A.

Urea.—*Assay in Blood Serum.*—Mestrezat and Janet publish a critical study of Fosse's xanthydrol urea assay (see YEAR BOOK, 1917, 492, 493, and 498) and find it satisfactory in the case of blood serum only if the following manipulation is rigidly adhered to: Dilute 10 mils of serum to the strength of about 0.5 gramme urea to the liter and mix the dilution with 10 mils of a concentrated Tanret reagent and then centrifuge. Mix 15 mils of the clear centrifuged fluid with an equal volume of glacial acetic acid and add at 10-minute intervals 3 portions of 3 mils each of a freshly prepared 10 per cent. solution of xanthydrol in methyl alcohol. Let the mixture stand 3 hours and then collect the crystals of xanthylurea, wash with a few mils of absolute methyl alcohol, dry and weigh. —J. pharm. chim., 22 (1920), 369.

A. Slosse finds that the hypobromite assay gives unreliable figures: too high if all of the evolved nitrogen is expressed as urea and too low if protein nitrogen is subtracted.—J. pharm. chim., 21 (1920), 292.

Blood.—*Alkalinity Influenced by Albuminoids.*—R. Clogne has studied the various methods suggested for determining the alkalinity of blood and he discusses the spectometric assay of Darc, the distillation method of Salaskin, the electrometric methods of Hober, Galeossi and a number of other investigators, and lastly the titrometric methods as suggested by a large number of chemists. Of the titrometric methods, he finds that suggested by Drouin (1906) the most satisfactory.

Discussing the various figures set as fair averages for the alkalinity of blood, he reports that his experiments show that all of these are faulty, since the excess acid added to the serum is taken up not merely by the mineral and protein alkaline bases but also by the albuminoids themselves. The paper describes his experiments along this line which, however, so far have failed to establish a correction figure for the acid absorbed by the albuminoids.—J. pharm. chim., 21 (1920), 49.

Blood.—*Assay of Ammonia in.*—P. Gérard mixes 10 mils of blood with 10 mils of 20 per cent. sodium or potassium carbonate solution and adds 2 mils of caprylic acid to prevent undue frothing. The mixture is placed in a flask provided with the proper glass tubing; one of the tubes passing into a flask containing 2 mils of centinormal sulphuric acid, 5 mils of water and 1 mil of caprylic alcohol. When the connections are made tight, air is pumped through the blood into the acid at the rate of 200 liters during the first five minutes and then at the maximum rate of 3 liters a minute until all of the ammonia has passed over into the acid. Then the acid is titrated with centinormal soda and the amount of ammonia absorbed by the acid is calculated by difference.—Comp. rend. Soc. Biol., through J. pharm. chim., 21 (1920), 236.

Blood.—*Assay of Calcium in.*—Kramer and Howland offer a method by which calcium can be estimated in small quantities (1 to 2 mils) of blood. The serum or plasma of the blood is carefully incinerated, the ash is dissolved in a small amount of sulphuric acid and to the solution an excess of volumetric oxalic acid solution is added, followed by sufficient water to obtain a definite volume. The mixture is then allowed to stand and filtered. In an aliquot part of the filtrate the excess of oxalic acid is titrated back with

potassium permanganate solution. From the amount of oxalic acid used for precipitating the calcium as oxalate, the calcium is calculated. The percentage of calcium in the blood is a rather constant one in healthy grown persons, about 9.5 milligrammes in 100 mils. Placenta blood contains 10.4 to 11.1 milligrammes, the blood of epileptics 10.7 milligrammes, while the blood of persons suffering from tetany contains much less calcium, from 3.7 to 7.2 milligrammes.—Journ. Biol. Chem., through Pharm. Weekbl., 57 (1920), 1387. (H. E.)

Blood.—*Assay of Chlorides in.*—Rodillon argues the importance of determination of the chlorides in the blood as an index of conditions in the kidneys. He commends as far superior to all other methods the Moog technic followed by the Carpentier-Volhard technic as very reliable and rapid. Exactly 11.7 mils of the filtrate after treating the serum with an equal volume of a 20 per cent. aqueous solution of trichloracetic acid, is mixed with 10 mils of tenth-normal solution of silver nitrate and 50 or 60 mils of distilled water, and 10 mils of a saturated solution of ammonio ferric alum. Then a tenth-normal solution of ammonium thiocyanate is added from a graduated burette, agitating constantly, until a persisting red tint appears. The chloride content in grammes per liter of serum equals the number of mils of the thiocyanate used. —Presse méd., through Drug. Circ., 64 (1920), 339.

Blood.—*Assay of Hemoglobin in.*—Robscheit reports on comparisons made on the various methods used for estimating hemoglobin percentages. The Sahli hemoglobin method when using the color tubes accompanying the instrument, gives very inaccurate results because of the decided variance in color density of the standard tubes, the result of fading. The Palmer method offers a very satisfactory means of hemoglobin determinations if the standard solutions are freshly prepared. Newcomer's method obviates many difficulties heretofore observed with other procedures, and gives good results with the glass 0.96 mm. in thickness, although the color is quite pale. A method is presented applying Palmer's procedure to Sahli's principle, which has proved most satisfactory. It removes the difficulty encountered with Palmer's method, the lack of stability of color in the standard solutions. It has the advantage of an easier color match than that of red tint. The

standards prepared have remained sufficiently unchanged for a period of eleven months to insure accurate hemoglobin determinations during this long period.—J. Am. Med. Assoc., through J. Am. Pharm. Assoc., 9 (1920), 450.

Blood.—*Assay of Sugar in.*—C. O. Guillaumin presents a 22 page article discussing with great minuteness desirable modifications in the assay methods of Bertrand and the colorimetric assay of Folin. For details, the reader is referred to the original paper.—J. pharm. chim., 22 (1920), 327 and 378.

Blood.—*Detection by Means of Hematoporphyrin Crystals.*—For the detection of blood in forensic analysis quite a number of methods have been devised, but most of these, as for instance the production of Teichmann's hemine crystals, can be applied only when the blood stain is relatively fresh. Some time ago Willstätter published an article in which he claimed that blood could be identified by the isolation of hematoporphyrin crystals, a substance hitherto obtained only in the amorphous form. Lochte and Danziger found that these crystals could be obtained only under certain working conditions and devised the following process by which seven-year-old blood stains could be detected on leather, rusty iron, etc. The stain is removed as much as possible and is heated at 40 to 50° for 15 minutes with 0.5 mil of a mixture of hydrobromic acid and glacial acetic acid. The mixture is allowed to stand for 36 to 48 hours at ordinary temperature, is then mixed with water, neutralized with caustic soda solution, again slightly acidulated with acetic acid and shaken two or three times with ether. The ether is evaporated on a small watch-crystal, the residue washed with the aid of 2 to 3 drops of alcohol into the center of the glass and mixed with 3 to 5 drops of hydrochloric acid. After allowing the mixture to stand for one or two days crystals of hematoporphyrin are formed.—Vierteljahrsch. gericht. Med., through Pharm. Weekbl., 57 (1920), 432. (H. E.)

Blood.—*Detection in Feces.*—P. N. van Eck cites 21 methods recommended for detecting blood in feces. Since most tests are seriously interfered with by certain ferments which are present especially after eating peas, nuts, etc., the author recommends

heating the feces at 175° by which the ferments are destroyed. The heating is done in a specially constructed apparatus and the disagreeable vapors are conducted through sulphuric acid. For the detection of blood he recommends Kuttner and Gutmann's method. About 8 grammes of the ferment-free feces is mixed with 8 grammes of acetone, the mixture is transferred to a filter, acetone is added and the feces are well disintegrated by means of a spatula. They are then triturated in a small mortar with 5 mils of glacial acetic acid, 10 mils of a 7 per cent. sodium chloride solution are added and the mixture is shaken out with 20 mils of ether. The ethereal solution is washed with double its volume of water and after the addition of a few drops of glacial acetic acid, tincture of guaiac and hydrogen dioxide solution are added.—Pharm. Weekbl., 57 (1920), 218. (H. E.)

Blood.—*Detection in Feces, Urine, etc.*—R. Lillig presents a very complete and comprehensive review of the various methods of showing the presence of blood in excretions and secretions. The various microscopic, spectroscopic and chemical tests are described in detail, and their bibliography is given.—Pharm. Ztg., 65 (1920), 16. (C. P. W.)

Blood.—*Detection of Hemin Crystals in.*—Strassmann modifies the Teichmann test as follows: To the blood stain on a glass slide are added a few drops of a mixture consisting of 1 part of 5 per cent. sodium chloride solution and 3 to 10 parts of glacial acetic acid, cover with cover glass, evaporate the acid over a flame and examine for crystals under the microscope.—Münch. Med. Wschr., through Am. J. Pharm., 92 (1920), 935.

Blood.—*Modified Van Deen Reaction for*—P. Lemay finds that the Van Deen reaction for hemoglobin (the blue color produced on addition of tincture of guaiac and hydrogen dioxide) is likewise produced by the oxydases from other animal fluids (milk, pus, sweat, etc.) He therefore modifies the test to remove these substances of similar action, by treating the sample with glacial acetic acid, shaking out with ether, separating the ethereal layer, evaporating the ether extract to dryness in a porcelain capsule and finally adding to the dry residue in the capsule a few drops of a freshly prepared fluid made by mixing 2 mils of tincture of guaiac,

5 drops of solution of hydrogen dioxide and 5 mils of ether.—J. pharm. chim., 22 (1920), 52.

Cephalo-Rachidian Fluid.—*Assay of Glucose in.*—Perrier discusses various methods of assaying small quantities of glucose. He finds the various copper assays unreliable, prefers the iodometric assay of Bougault (see YEAR BOOK, 1917 386) and gives a line of experiments showing the best conditions for carrying out the assay.

For cephalo-rachidian liquid, Perrier recommends the following procedure: Precipitate the proteids from 5 mils of the fluid by the addition of 2.5 mils of acetic sodium chloride (sodium chloride, 15; glacial acetic acid, 1; water to make 100). Warm 3 mils in boiling water, then cool, neutralize with diluted soda solution, bring the volume of the liquid to 30 mils and filter. To 20 mils of the filtrate add 1 mil of 1.5 per cent. sodium carbonate solution, followed by 20 mils of centinormal iodine V. S. Let stand 2 hours and then titrate the residual iodine with n/200 thiosulphate V. S., using starch paste as indicator. Each mil of centinormal iodine consumed represents 0.45 milligrammes of glucose.—J. pharm. chim., 22 (1920), 337.

Cephalo-Rachidian Fluid.—*Colloidal Benzoin Suspensions for Detecting Pathological.*—Guillain, Laroche and Léchelle find that while normal cephalo-rachidian fluid does not precipitate benzoin suspensions, pathological samples do. For the complex technique the reader is referred to the original paper.—Compt. rend. Soc. Biol., through J. pharm. chim., 22 (1920), 356.

Cephalo-Rachidian Fluids.—*Determining the Alkalinity of.*—R. Fabre finds that ordinary alkalimetric titrations of these fluids do not give true readings of their alkalinity. The proper procedure, he finds, is to titrate with centinormal acid and phenolphthalein to neutrality and then add methyl orange and titrate with centinormal acid until the latter indicator shows neutrality. Phenolphthalein shows the conversion of the sodium carbonate present into bicarbonate; while methyl orange indicates the change of the bicarbonate into the chloride or sulphate, according to the volumetric solution used. By recognizing this fact, the relative quantities of carbonate and bicarbonate in the fluid may be determined and the ratio between these are of diagnostic value.—J. pharm. chim., 21 (1920), 225.

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136 Liberty St., New York, N. Y.

Weicker, Theo.,
80 Beekman St., New York, N. Y.

WEIDEMANN, CHAS. A., PH.G., M.D.,
2148 Green St., Philadelphia, Pa.

Weidman, I. S.,
3310 N. 15th St., Philadelphia, Pa.

Weidner, Elmer M.,
Birdsboro, Pa.

Weil, Joseph L.,
235 Greenwich St., New York, N. Y.

Weimer, Roth Eardon,
20 Wabash St., W. E., Pittsburgh, Pa.

Weinberg, Samuel Ernest,
691 23rd Ave., San Francisco, Calif.

Weinkauff, Jacob,
600 Fifth Ave., Peoria, Ill.

Weinschenk, Harvey,
Main St., Babylon, N. Y.

Weinstein, Samuel,
1608 W. Grace St., Richmond, Va.

Weise, Carl E.,
2704 West End Ave., Nashville, Tenn.

Weismiller, Paul V.,
1114 N. St. Clair St., East Liberty P. O., Pittsburgh, Pa.

Weisner, Nicholas F.,
20th & Parrish Sts., Philadelphia, Pa.

Weiss, Emil O.,
794 6th Ave., New York, N. Y.

Weiss, Josephine Mary,
121 W. Jefferson St., Iowa City, Ia.

Weiss, Louis Ralston,
4807 N. Hermitage Ave., Chicago, Ill.

Weiss, Sydney,
1819 W. 39th St., Chicago, Ill.

Weitgenant, Wayne W.,
100 N. 1st St., Raton, New Mexico.

Welfare, Sam E.,
Winston-Salem, N. C.

WELLCOME, HENRY S.,
Snow Hill Bldg., London, Eng.

Wells, James H., LL.B., Ph.G.,
Main & Chicago Aves., Evanston, Ill.

Welsch, Henry,
2701 Peniston St., New Orleans, La.

Welsh, Joseph B.,
2350A Virginia Ave., St. Louis, Mo.

Wendt, Wm. C.,
47 S. High St., Columbus, O.

Wentland, William Henry,
Drawer N. 248, Manor, Tex.

Werba, Peter Cyrel,
4220½ 12th Ave. N. E., Seattle, Wash.

Werkheiser, Harold Edwin,
713 Bushkill St., Easton, Pa.

Werner, Carl Ali Anderson,
Box D, Albert City, Iowa.

Werner, Louis,
914 Race St., Cincinnati, O.

Werner, Wm. F.,
2202 E. 10th St., Indianapolis, Ind.

Wertz, Eddie M.,
301 Brady St., Davenport, Iowa.

Wesner, Henry C.,
Box 388, Windsor, Mo.

Westbrook, Chas. G.,
Lock Box 134, Newbern, Tenn.

Westcott, James W., Ph.G.,
Charles & Franklin Sts., Baltimore, Md.

Westheimer, David,
305 Commercial Bank Bldg., Houston, Tex.

Westmoreland, Edwin R., Ph.G.,
Lockhart, Tex.

Wetterstroem, Caroline (Mrs.),
2844 Colerain Ave., Cincinnati, O.

Wetterstroem, Theo. D., Ph.G.,
514 Schultz Bldg., 232½ N. High, Columbus, Ohio.

Weygandt, William H.,
170 S. 9th St., Brooklyn, N. Y.

Wheatcroft, John C.,
c. American Buying Club, 31 W. Lake St., Chicago, Ill.

Wheeler, Albert A., Phar.D.,
60-64 Adams Ave. W., Detroit, Mich.

Wheeler, Carlton B.,
18 Main St., Hudson, Mass.

WHELPLEY, HENRY M., PH.G., M.D.,
2342 Albion Pl., St. Louis, Mo.

Whidden, Ray Allen,
161 N. Franklin St., Chicago, Ill.

Whipple, Oscar Kellogg,
Broad & Fayette Sts., Bridgeton, N. J.

Whisenhaut, Nathaniel Lyon,
742 Poydras St., New Orleans, La.

White, Benjamin,
375 South St., Jamaica Plain, Boston, Mass.

White, Edw. R.,
Main St., Salisbury, Md.

White, Herbert E.,
Jamestown, N. D.

White, Jennie Maguire,
416 Hayes St., San Francisco, Calif.

White, Joseph L.,
c. B. O. & G. C. Wilson, Inc., 196 Cambridge St., Boston, 14, Mass.

White, Louis Mortimore,
530 E. Park St., Oklahoma City, Okla.

White, Robert C.,
23 N. 7th St., Philadelphia, Pa.

White, Roy Allen,
Residence unknown.

White, Walter H.,
39 S. Palifox St., Pensacola, Fla.

White, Wm. R., Ph.C.,
311 Grace St., Nashville, Tenn.

Whitehill, John,
3328 Chestnut St., Philadelphia, Pa.

Whitehouse, Harry,
Johnson City, Tenn.

Whitley, J. F.,
Gilliam, La.

Whitlock, William Thomas,
423 Riverside Ave., Spokane, Wash.

Whitney, David V., Ph.G.,
714 Wyandotte St., Kansas City, Mo.

Whitney, Maxson Hall,
5449 Indiana Ave., Chicago, Ill.

Whitney Minnie, M. (Mrs.),
714 Wyandotte St., Kansas City, Mo.

Whitney, Robert Buckingham,
Residence Unknown

Whittemore, Lee A.,
Grand Rapids, Minn.

Whittington, Omar Harwell,
Van Buren, Ark.

Whittlesey, Henry H.,
East Side Pharmacist, Pocatello, Idaho.

Whorton, Carl,
c. The Gadsden Wholesale Drug Co., Gadsden, Ala.

Whyte, Hilson H.,
426 S. 13th St., Philadelphia, Pa.

Wiberg, George,
683 Ashburn St., Winnipeg, Manitoba, Canada.

Wible, Hollis M.,
Box 201, Camp Hill, Pa.

Wich, Henry E.,
1230 N. Stricker St., Baltimore, Md.

Wickham, Edward A.,
540 Norwood St., E. Orange, N. J.

WICKHAM, WM. H.,
270 Park Ave., New York, N. Y.

Widrig, T. J.,
6th and Washington Ave., Newport, Ky.

Wieczorek, Walter W.,
1174 Milwaukee Ave., Chicago, Ill.

Wierks, Clarence,
c. Schlagel's Pharmacy, Davenport, Iowa.

Wiertelak, Albert P.,
4643 S. Mozart St., Chicago, Ill.

Wierzbicki, Stephen,
Naval Hospital, League Island, Philadelphia, Pa

Wiggin, Harry C.,
14 Fulton St., Boston, Mass.

Wignall, William G.,
Western Pennsylvania Hospital Friendship and Mellvale, Pittsburgh, Pa.

Wilcox, Levi, Ph.B.,
145 Woodlawn Ter., Waterbury, Conn.

Wilder, Gaston H.,
510 23rd. St., Galveston, Texas.

Wiles, Wood,
104 W. Walnut St., Bloomington, Ind.

Wiley, Harvey W.,
Cosmos Club, Washington, D. C.

Wilhelm, Werner F.,
7425 Lafayette St., Englewood Sta., Chicago, Ill.

Wilkerson, A. F.,
Marion, Ala.

Wilkes, Miss Jean Robin,
1510 Melrose Ave., Seattle, Wash.

Wilkinson, T. D., Jr.,
Church St., Madison, Ala.

Willer, Max,
989 Amsterdam Ave., New York, N. Y.

Williams, Edward,
1253 Williamson St., Madison, Wis.

Williams, George,
Reliance, S. D.

Williams, Guy Yandell,
468 Elm Ave., Norman, Okla.

Williams, John E.,
Residence Unknown

Williams, John Lewis,
Doctor of Optics, P. O. Box 718, Three Rivers, Providence, Quebec.

Williams, John M.,
c. Marinello Co., La Crosse, Wis.

Williams, Lawrence S.,
1300 N. Caroline St., Baltimore, Md.

Williams, N. Emery, Ph.G.,
508 N. Grand Ave., St. Louis, Mo.

Williams, Thomas R.,
Larimore, N. D.

Williams, Walter G.,
Charlotte C. H., Va.

Williamson, Gordon James,
3 Charles St., Dorchester, Mass.

Williamson, Harry Hays,
U. S. Naval Hospital, San Diego, Cal.

Williamson, J. W.,
Harrisonburg, Va.

Williamson, Thomas M.,
40 N. Market St., Frederick, Md.

Willman, Wm. G.,
Adams St., Brownsville, Tex.

Wilson, Chas. E.,
1024 Taylor St., Corinth, Miss.

Wilson, Chas. F.,
c. Pitman & Wilson, Rushville, Ind.

Wilson, Edward Claudius,
1100 Tunstax Ave., c. Wilson's Pharm., Norfolk, Va.

Wilson, George Henry,
209 S. 4th St., Steubenville, Ohio

Wilson, Harvey E.,
11653 Longwood Drive, Morgan Park Station, Chicago, Ill.

Wilson, Lincoln,
3973 Tennyson St., Denver, Colo.

Wilson, Robert C.,
University of Georgia, Athens, Ga.

Wilson, Smith C.,
143-145 N. 9th St., Lincoln, Neb.

Wilson, Wm. N.,
Independence, La.

Wiltsee, Lee,
c. Merrell Co., 5th and Pike Sts., Cincinnati, O.

Wimmer, Curt Paul,
115 W. 68th St., New York, N. Y.

Wincott, Robert T.,
1013 W. Lake, Minneapolis, Minn.

Windmueller, Ralph Wm.,
159 Ashland Ave., River Forest, Ill.

Windolph, J. Fred,
Hayes St., Norwich, N. Y.

WINKELMANN, JOHN H.,
118 West Lombard St., Baltimore, Md.

Winne, Arthur L. I.,
601 W. 24th St., Richmond, Va.

Winski, Frank B.,
34 Woodland Pl., Stamford, Conn.

Winter, Carl,
300 Electric Bldg., Prospect Ave., Cleveland, Ohio.

Winter, James H.,
1375 Valencia St., San Francisco, Cal.

Winters, Arthur James,
Elk Rapids, Mich.

Wirth, Adam, Ph.M.,
5902 Hurst, Cor. Elenore St., New Orleans, La.

Wirth, Elmer H.,
c. F. F. Ingram Co., Detroit, Mich.

Wirthman, John G.,
3436 Broadway, Kansas City, Mo.

Wirthman, Joseph C.,
3100 Troost Ave., Kansas City, Mo.

Wisner, Ebert H.,
c. The Wisner Pharmacy, Buchanan, Michigan.

Witt, Abraham R.,
261 Columbus Ave., New York, N. Y.

Witt, William John,
Elkader, Iowa.

Witting, Fred F., Ph.G.,
1711 Penna St., Denver, Colo.

Wittkamp, Clarence T.,
3650 Erie Ave., Cincinnati, Ohio.

Wittman, Albert W.,
Delano, Minn.

Woehner, Fred A.,
c. Great Falls Drug Co., Great Falls, Mont.

Woehner, Walter Albert,
c. L. K. Liggett Co., Lexington Bldg., Baltimore, Md.

Woell, John,
312 Front St., Hempstead, N. Y.

Wolf, Chas. A.,
401 S. Broadway, Baltimore, Md.

Wolf, J. Carlton, Phar.D.,
401 S. Broadway, Baltimore, Md.

Wolfe, Cecil Dewey,
5115 S. Michigan St., Chicago, Ill.

Wolfe, Joseph Albert,
U. S. Quarantine Station, Rosebank, Staten Island, N. Y.

Wolff, D. O.,
531 Main St., Melrose, Mass.

Wolff, Edw. H.,
522 Washington Ave., St. Louis, Mo.

Wolff, Fred,
26 Arcade Bldg., Pullman Sta., Chicago, Ill.

Wolfson, Joseph,
835 Columbus Ave., New York, N. Y.

Wood, Frank Davidson,
505 Beechurt Ave., Morgantown, W. Va.

Wood, Horatio C., Jr., M.D.,
1905 Chestnut St., Philadelphia, Pa.

Wood, I. V.,
Mobile, Ala.

Wood, James P.,
2 Church St., New Haven, Conn.

Woods, Robert J.,
Winnett, Mont.

Woods, Samuel R.,
110 S. Main St., Lamar, Colo.

Woodside, Alva Melville,
87 White St., East Boston, Mass.

Woodson, George David,
Haworth, Okla.

Woodward, Seymour Eastman,
165 Hemenway St., Suite No. 19, Boston, Mass.

Wooten, Thos. V.,
43-93 Leon St., Boston, Mass.

Wooyenaka, Keizo,
1037 Higashi-Nakano, Nakano, Toyotamagum, Tokio, Japan.

Worner, William August,
801 Canal St., New Orleans, La.

Worrall, Wesley,
143 Lancaster Ave., E. Downingtown, Pa.

Worsham, John T.,
509 N. Meadow St., Richmond, Va.

Worth, Thos. R.,
109 N. Main St., Sebastopol, Cal.

Worthington, John W. W.,
Jefferson Hospital, Philadelphia, Pa.

Wrensch, H. E., Jr.,
258 Claremont Ave., Montclair, N. J.

Wright, Herbert G.,
1647 E. Genesee St., Syracuse, N. Y.

Wright, John Shepard,
3718 North Pennsylvania St., Indianapolis, Ind.

Wright, Marshall M.,
528 Main St., Lewiston, Idaho.

Wruble, Milton,
221 Belmont Ave., Detroit, Mich.

Wuester, Mary C.,
Northern Bldg., Cor. 2d & Main Sts., Wichita, Kansas.

Wulling, Fred J.,
Minnesota University, Minneapolis, Minn.

Wumkes, Peter E.,
Sykeston, N. D.

Wunderlich, Edw.,
1738 Broadway, New Orleans, La.

Wurdack, John H.,
15 Grape St., Mount Olive P. O., Pittsburgh, Pa.

Wyckoff, Elmer E.,
530 Mansfield Pl., Brooklyn, N. Y.

Wyllie, John Hardie,
4954 Washington Blvd., St. Louis, Mo.

Wyman, Abraham,
5718 Lansdowne Ave., Philadelphia, Pa.

Wyman, Lloyd Rodney,
233 Van Voast Ave., Bellevue, Ky.

Wyszynski, Walter H.,
8737 Commercial Ave., South Chicago, Ill.

Yackel, Arthur J.,
Springfield, Minn.

Yaffe, Joseph Philip,
193 Chambers St., Boston, Mass.

Yarbrough, Charles George,
Monroeville, Ala.

Yarp, Ruth C. (Mrs.)
413 E. 50th St., New York, N. Y.

Yates, Franklin B.,
155 Leonard St., New York, N. Y.

Yeager, Emery James,
1214 Heath St., Lafayette, Ind.

Yeomans Sidney C.,
c. American Druggists' Syndicate, Long Island, N. Y.

Yongue, James Douglas,
Pickens, S. C.

Young, Fred H.,
Lake Bluff, Ill.

Young, Geo. O.,
Buckhannon, W. Va.

Youngken, Heber W., Ph.G., A.B., A.M., Ph.M., Ph.D.,
145 N. 10th St., Philadelphia, Pa.

Zacovic, Andrew,
46 Collins Ave., Uniontown, Pa.

Zagat, Mandel,
Prospect Ave. & 156th St., Bronx, N. Y.

Zahajkiewicz, Vincent Michael,
2026 Webster Ave., Chicago, Ill.

Zaleski, Rufus E. G.,
3201 Wallace St., Chicago, Ill.

Zamboni, William C.,
549 S. Oak St., Owatonna, Minn.

Zeamer, Harry W.,
240 Locust St., Columbia, Pa.

Zehner, Guy Oram,
c. Bristol Myers Co., Hillside Plant, W. Elizabeth, N. J.

Zeigler, Washington Hayne,
c. Medical College of S. C., 213 Rutledge Ave., Charleston, S. C.

Zeluff, Irvin Simpson,
Furmount Ave., Hollis, Long Island, N. Y.

Zeman, Isador Louis,
925 James St., N. S., Pittsburgh, Pa.

Zettelmeyer, Herbert,
1302 Belle Ave., Lakewood, Ohio.

Zich, Theodore Albert,
7839 Riopelle Ave., Detroit, Mich.

Zickes, Elmer Joseph,
4521 Clark Ave. S. W., Cleveland, O.

Ziefle, Adolph,
Oregon Agriculture College, Corvallis, Ore.

Ziegler, Howard P.,
210 Windsor St., Reading, Pa.

Zielinski, Max. A.,
4083 E. 66th St., Cleveland, Ohio.

Zieske, Arthur, Ph.G.,
214 1st Ave. S. W., Watertown, S. D.

Zillig, Adam,
Dubuque, Iowa.

Zimmerman, Theophilus,
Rose Free Dispensary, 7th & Cherry Sts., Terre Haute, Ind.

Zindler, Fred Lewis,
3119 Jefferson East, Detroit, Mich.

Zingales, Gaetano,
114 Walnut Ave., Cranford, N. J.

Zink, Edward,
203 Fulton St., New York, N. Y.

ZOELLER, EDW. V.,
Main St., Tarboro, N. C.

Zoeller, Geo.,
1557 W. Chicago Ave., Chicago, Ill.

Zook, Carl E.,
51 W. Market St., Lewistown, Pa.

Zottman, Wm. H.,
1 Church St., Burlington, Vt.

Zuck, F. J.,
2008 E. State St., Rockford, Ill.

Zuenkeler, J. Fred., Ph.G.,
124 Woolper Ave. (Clifton), Cincinnati, Ohio.

Zuercher, Oscar,
Kenmare, N. D.

Zufall, C. J.,
2504 Main St., Lafayette, Ind.

Zurawski, Marcys Joseph,
3702 S. Paulina St., Chicago, Ill.

Zverina, Justin George,
12210 Miles Ave., Cleveland, Ohio.

Zwick, Mary Hall (Mrs.),
511 S. Humphrey Ave., Oak Park, Ill.

Zwilling, Harry,
108 Pitt St., New York, N. Y.

GEOGRAPHICAL ROLL OF MEMBERS

HONORARY MEMBERS

FOREIGN COUNTRIES

AUSTRALIA

J. H. Maiden, *Sydney,* 1920

ENGLAND

Sir William Glyn Jones, *London,* 1920
E. M. Holmes, F.L.S., *London,* 1899
Henry George Greenish, *London,* 1913
David Hooper, F.I.C., F.C.S., *Weston,* 1899
Wm. Kirby, M.Sc., *Manchester,* 1920

FRANCE

Prof. Emilie Bourquelot, *Paris,* 1920
Prof. Leon Guignard, *Paris,* 1920

GERMANY

Dr. Arthur Meyer, *Marburg,* 1910
Dr. Herman Schelenz, *Cassel,* 1912

SWITZERLAND

Dr. Heinrich Zoernig, *Basel,* 1916
Dr. Alexander Tschirch, *Berne,* 1910

ACTIVE MEMBERS

(List corrected to May, 1922.)

Members are requested to report any inaccuracies in these lists, and to notify the General Secretary and Treasurer of all changes of address.

(The names of Life Members in Capitals. Names of Life Members under the old Constitution in *italics*. Figures at the right indicate the year in which the member joined the Association.)

UNITED STATES OF AMERICA

ALABAMA—ALASKA—ARIZONA—ARKANSAS

ALABAMA.

Alabama City.

Bilbro, Griff E.....1922

Auburn.

Blake, Lynn Stanford.....1914
Marsh, George Henry.....1920
MILLER, EMERSON ROMEO.....-1895
Toomer, S. L.....1918

Birmingham.

Chumley, Tim V.....1921
Gibbs, Elbert W.....1921
Kissell, Verttle T.....1921
Krauss, Lauren E.....1921
Morris, L. G.....1921
Patton, John W.....1921
Pittman, Winston J.....1921
Shiflett, Barry O'Neal.....1920

Ensley.

Fleming, R. W.....1921
Walker, Charles Robert.....1918

Fairfield.

Herlong, E. A.....1921

Foley.

Dumas, James T.....1921

Gadsden.

McDiarmid, Daniel Palmer.....1909
Vance, Winfield Scott.....1909
Whorton, Carl.....1908

Guntersville.

Thomason, William Pearce.....1910

Haleyville.

Foster, H. B.....1921

Huntsville.

Latham, Carter H.....1921

Madison.

Wilkinson, T. D., Jr.....1921

Marion.

Wilkerson, A. F.....1922

Mobile.

Demuny, Marshall J.....1915
Ebbecke, Philip Gustave.....1922
Eichold, Bernard Herbert.....1905
Mitchell, Dan.....1921
Moog, Miss Allie.....1921
Wood, I. V.....1921
Van Aller, Thomas S.....1907
Van Antwerp, James Callanan...1905

Monroeville.

Yarbrough, Charles George.....1921

Opine, Clarke County.

Pugh, Earl Elmo.....1921

Prichard

Butterley, William Starr.....1921

Tuscaloosa.

Bingham, William Ellison, A.B., Univ. of Miss.....1909

Tuskegee.

Lewis, Lawrence Campbell.....1910

York.

Scruggs, Robert Houston.....1921

ALASKA.

Anchorage.

Loussac, Zachary Joshua.....1916

ARIZONA.

Mesa.

Grandy, Seth Parker.....1916

Nogalez.

Nankivell, John H.....1919

ARKANSAS.

Atkins.

Hogan, Walter C.....1918

Blytheville.

Barnett, William T.....1920

Camden.

MORGAN, AYLMER LEE.....1890

Cotton Plant.

McComb, Joel Virgil.....1921

Dewitt.

Latimer, Booker.....1920

Hot Springs.

Caldwell, Charles B.....1921
Eisele, Martin Augustine.....1907
Lehman, Charles Walter, A.B...1907

Little Rock.

Bracy, Samuel Virginius.....1922
Bradford, John Davis.....1920
Danforth, William James.....1922
Fein, Mary A., Miss.....1907
Hanggi, Emil John.....1920
Schachleiter, Frank.....1917
Snodgrass, Latta Kavanaugh....1901
Trevaskis, Wm. J.....1918

Lonoke

Conery, William Joseph.....1922

Paragould.

Paris, James E., Ph.G.....1908

Piggott.

POTTER, MAYNARD H., PH.G., PH.C. 1906

Springdale.

Just, Julius Frederick.....1921

Van Buren.

Whittington, Omar Harwell.....1915

Warren.

Appleton, William Riley.....1901
Davis, A. T.....1914

West Memphis.

Dodd, Adam Samuel.....1921

CALIFORNIA.

Altadena.

Leavitt, Adoniram Judson.....1905

Arcadia.

Seaquist, Oscar Wm.....1918

Auburn.

Stevens, Frederick Solon.....1903

Bakersfield.

Baer, Edward Arthur.....1907
Hughes, James A.....1909

Berkeley.

Lea, E. J.....1918
Mueller, Fred.....1915

Escondido.

STEVENS, ALVISO BURDETTE.....1885

Eureka.

Bohmansson, Robert Hugo.....1901

Fresno.

Lich, Robert.....1917

Gilroy.

Rasmussen, Ethel.....1920

Half Moon Bay.

Morgan, Charles Levin.....1915

Huntington Park.

Guest, Wilbert Hillman.....1909

Long Beach.

Smith, Lauriston Stephen, Ph.G.1892

Los Angeles.

Binz, Edward Gabriel.....1909
Carter, Fred Louis.....1905
Ford, Charles Mangan.....1887
Frock, Lyle Price.....1922
Harvey, J. Parker.....1921
Howard, Perley Winsor.....1922
Lindvall, Charles Gustaf.....1897
Maas, Arthur R.....1916
Patterson, James Numa.....1916
Reilly, Robert C.....1901
Sauvinet, Charles D.....1902
Schiff, Ludwig.....1912
Stabler, Lavid J.....1915
Thoroman, R. R.....1920

Mountain View.

Wagner, Louis.....1908

Oakland.

Correia, Mary Ellen.....1921
Lee, Robert Andrew.....1907
MacCorkell, Ronald William....1922
Philip, Waldemar Bruce, Ph.G., Phar.D. 1907
Varney, Edward Francis.....1892

Pasadena.

JAMIESON, THOMAS NEVIN.....1903

Patton.

Dyna, Carl Frederik Julius, Ph.G.1909

Sacramento.

Grazer, Frederick Augustus.....1922
Kirk, H. S.....1913
Lichthardt, Geo. H. P.....1902

San Diego.

Bote, Lester Elmer.....1916
Ferris, Alda M.....1922
Robinson, Milton L.....1922
Strahlmann, Edward.....1909
Williamson, Harry Hays, B.S...1916

San Francisco.

Carey, Henry B.....1909
Eaton, Elgar Otis.....1915
Fletcher, David M.....1904
Flint, John Henry.....1909
Gibson, Frank L.....1904
Green, Franklin Theodore.....1908
Hammar, Alrick, Chief Pharmacist, U. S. Navy.....1897
Headen, Claude Thomas, Ph.C..1909
Hereth, Franklin Samuel.....1893
Jorgenson, Arthur Lawrence Theodore 1916
Lackenbach, Fred Isadore, Ph.C.1907
Lengfeld, Joseph Louis.....1909
McLain, Percy L.....1921
Nish, Frederick William.....1916
Poehner, Adolf Adam, Ph.G., M.D. 1907
Roehr, Clarissa Mary (Miss)...1908
Sharp, Solomon A.....1902
Sister Mary Joseph.....1922
Spurgeon, Ellis Lawrence.....1922
Weinberg, Samuel Ernest.....1922
White, Jennie M.....1914
Winter, James Henry.....1904

Sanger.

Brehler, Oscar August.....1909

San Jose.

Doerr, Louis.....1917
Dore, Cornelius W.....1915
Pellerano, Nicholas Andrew.....1909

San Leandro.

Thomas, Tony B.....1916

Santa Cruz.

Moore, David Charles.....1921

Sawtelle.

Clarke, Neville Campbell.....1922

Sebastopol.

Worth, Thomas Renfro.....1909

Stanford University.

Alsberg, Carl L., A.B., A.M., M.D. 1912
Merner, Paul Marcus.....1915

South Pasadena.

Taylor, Walter T.....1922

Stockton.

Rehfuss, Jacob H.....1913

Ventura.

Newby, Thomas S.....1916

COLORADO.

Akron.

Van Liew, William Kirk.....1913

Boulder.

Fine, Eben Givens.....1913

Central City.

Davies, Llewellyn Powell.....1891

Denver.

Ajer, Arche G.....1920
Best, John.....1866
Beukma, William.....1913
Clark, Alfred William.....1908
Clayton, Charles J.....1905
Cordes, Henry.....1913
Engle, Wilber Dwight.....1917
Hensel, Samuel Theodore, Ph.G.1913
Hover, William Adgate.....1895
Hover, William Tracy.....1913
Jeancon, Louis Augustus.....1912
Lord, Frank Jotham.....1912
Pillsbury, Arthur Lee.....1914
Ryan, Alonzo S.....1913
Scholtz, Edmund L.....1909
Secheverell, Hugh Bennett.....1913
Swoboda, Adolph.....1909
Tobin, Sister Mary Andrew.....1922
Walbrach, Arthur.....1881
Watson, Robert Gordon.....1916
Wilson, Lincoln.....1910
Witting, Frederick Frank, Ph.G..1902

Englewood.

Crysler, Edwin Walter.....1921

Fort Collins.

Scott, Alexander Weir.....1906

Fowler.

Palmer, William Gordon.....1909

Lafayette.

Dow, John Peter.....1904

Lamar.

Woods, Samuel Ross, Ph.G.....1913

Leadville.

McKenzie, Robert Henry, Ph.G.1908

Pueblo.

Mortenson, Frank Emil, Ph.G...1910

COLUMBIA, DISTRICT OF.

Washington.

Beall, Herbert Ninian.....1915
Beucler, William George.....1915
Bradbury, Wymond Henry, Phar.D. 1895
Braisted, Wm. Clarence.....1922
Brown, Clark L.....1911
Cannon, Claude C.....1920
Doran, James M.....1921
DuMez, Andrew Grover.....1915
Easterday, Herbert Clifton.....1920
Flemer, Lewis.....1895
Fuller, Henry Corbin.....1915
Garrels, Charles.....1914
Henry, Frank Clinton.....1894
HILTON, SAMUEL LOUIS, PHAR.D.1890
Kalusowski, Henry E.....1904
KEBLER, LYMAN FREDERIC.....1894
Kerfoot, William T.....1920
Mayo, Redmond.....1918
Megaw, Herschel.....1917
Murray, Alexander G.....1920
O'Brien, Daniel Joseph.....1920
POWER, FREDERICK BELDING.....1872
Quigley, Richard Lucien.....1902
Rabak, Frank.....1905
Richardson, Willard Stowell....1900
SCHAFFER, CHAS.....1903
Sievers, Arthur.....1906
Silvester, Paul.....1922
Stam, Lillian R.....1919
Stevenson, Arthur Earl.....1912
Stockberger, Dr. Warren W....1914
Stone, Frank Taylor.....1918
Suter, Arthur Lee.....1915
Vane, Patrick P.....1911
Viehoever, Arno, M.D.....1915
Wiley, Harvey Washington.....1902

CONNECTICUT.

Bridgeport.

Damtoft, Knud J.....1916
Leverty, John Augustine.....1900
Ostrofsky, Frank Joseph.....1910
Siller, Morris Milton.....1922

Hartford.

Bienstock, Samuel.....1916
Gladding, Curtis Parsons.....1912
Glassman, Albert M.....1922
Gorman, Chas. F.....1916
Hockert, Bruno E.....1916
Pierce, Burritt Hill.....1921
Sagarino, Rocco J.....1920
Sister M. Euphemia Donahue...1922

Meriden.

Pink, Charles H.....1916

Middletown.

Boyles, Augustine B.....1922
PITT, JOHN RICHARD.....1872

New Haven.

GESSNER, EMIL ADOLPH.....1878
Ginsberg, Julius.....1917
Hoff, Karl Wm.....1917
Hull, Chas. T.....1918
Hussion, Walter A.....1922
Jenkins, Edward H.....1913
Noyes, Charles Warren.....1922
Wood, James Prior.....1890

Noroton.

Gilbert, Cyrus Thurston.....1913

Norwich.

Ricker, William D.....1922
Sisk, Franck A.....1922

Stamford.

Winski, Frank B.....1916

Terryville.

Viering, Edward Alois.....1921

Waterbury.

Ebbs, John Buddington.....1922
Newton, Clark H. W.....1916
Wilcox, Levi, Ph.B.....1903
Xavier, Sister M.....1922

Willimantic.

Cartier, Gustave O.....1913

Winsted.

Barrett, Leslie Burns.....1921

DELAWARE.

Seaford.

Kaufman, Reuben M., Ph.G....1909

Wilmington.

Bosley, John Oliver.....1918
WATSON, HERBERT KENNEDY....1884

FLORIDA.

Daytona.

Seaman, Frederick Anthony....1905

De Land.

Fisher, George Washington.....1893

Jacksonville.

Chelf, Roy N.....1918
Ramsaur, David Wilfong.....1902

Lakeland.

Lemasters, William Otterbein...1905

Miami.

Parnell, Wallace B.....1920

Ocala.

Parrish, Joseph Gid.....1921

Pensacola.

Hannah, Malcolm E.....1914
Petterson, Ernest Wilhelm.....1905
White, Walter H.....1918

St. Augustine.

Coe, E. G.....1920

St. Petersburg.

Apple, Mrs. Mary E.....1921

Tallahassee.

Henry, Arthur Malcolm.....1913

Tampa.

Berger, Ernest.....1902
Monroe, Harley R.....1916

GEORGIA.

Americus.

Murray, Emmett L.....1920

Athens.

Wilson, Robert C.....1915

Atlanta.

Bliss, A. Richard, Jd.....1919
Jacobs, Sinclair Sartorius.....1915

Augusta.

Land, Robert Henry, Jr.....1902

Macon.

Meaders, Thomas Arthur.....1921

Nicholls.

Thompson, William Daniel.....1920

Pelham.

Taylor, Willie Guss.....1921

Savannah.

Rowlinski, Robert Antone.....1892
Solomons, Isaiah Abraham.....1894
Solomons, Isaiah, Jr.....1913

Thomasville.

Mash, Henry Terrell, Jr.....1917
Thomas, Robert, Jr.....1888

Vidalia.

Page, Orion.....1921

HAWAIIAN ISLANDS.

Honolulu.

Miller, Leo John.....1921
Smith, George Waterman.....1915

IDAHO.

Boise.

Ballou, Clarence Orlando.....1909

Lewiston.

Wright, Marshall M.....1921

Pocatello.

Buehler, John J.....1913
Leonard, Eugene O.....1920
Whittlesey, Henry Hawley.....1910

Shoshone.

Carter, Charles.....1921

Twin Falls.

Dooley, Earl R.....1922
Spargur, Roy Miles.....1910

ILLINOIS.

Alton.

Barth, August F.....1920

Arlington Heights.

Altstadt, Benjamin W.....1917

Ashley.

Martin, Roeburn Le Roy.....1921

Aurora.

Benton, L. N.....1918
Chawgo, Harry E.....1922
Eberly, Ralph Milton.....1918
Frauenhoff, Frederick Louis, Ph.G......1909
Funk, Herbert E.....1921
Harris, Warren Frank.....1920
Staudt, Louis Carl, Ph.G.....1890
Terry, Ralph Eugene.....1920

Batavia.

Schreiner, Albert.....1914

Beardstown.

Denton, W. S.....1920

Berwyn.

Black, Willis E.....1920
Tuma, Charles P.....1921

Bloomington.

Moore, Dwight, D.....1922

Blue Island.

Dorjahn, John A.....1921

ILLINOIS.

Brookfield.

Corleto, Joseph Frank.....1921

Buffalo Prairie.

Childs, Frank Samuel.....1920

Bushnell.

Barnes, R. R.....1922

Cairo.

Lehning, Fred P.....1919
Thomas, Frank.....1920

Cambria.

Stotlar, Jo 1921

Canton.

Webster, Richard C.....1914

Carlinville.

Graham, Frank William.....1916

Champaign.

Littman, Edwin R.....1922

Chicago.

Abrahamson, Carl.....1918
Ackermann, Albert George, Ph.G. 1909
ADAMICK, GUSTAVE HATTENHAUER 1891
Adams, William Thrall.....1920
Africk, Abraham Mair.....1922
Ahlborn, Frank H.....1918
Alex, Frank.....1921
Alexa, Anthony Joseph.....1921
Anderson, G. L.....1920
Antonides, Edward F.....1921
Antonow, Samuel L.....1918
Appel, David Maurice.....1922
Avery, Charles Hamilton.....1905
Backus, E. J.....1913
Baeslau, Wm. F.....1921
Baltes, Miss Helen L.....1920
Bangert, Howard Wells.....1919
Bangert, Louis Edward.....1919
Beavo, Mabel S. (Mrs.).....1918
BECKER, IRWIN ATWOOD, B.S., PH.G. 1905
Behrens, Frederick Francis Ferdinand 1920
Belleza, Edgard C.....1920
Berardi, James B.....1921
Bignold, Wilfrid James.....1921
Bleiweiss, Sydney.....1921
Blocki, John.....1909
Bochner, Isidor.....1922
Bodemann, Wilhelm.....1906
Boehm, John J.....1905
Bornhoeft, John Edward Henry.1921
Borovik, Geo. S.....1921
Borucki, Alphonso William.....1922
BORUCKI, EDWARD A. F..... 1920
Boyer, Alden Scott.....1919
Brann, Wm. Paul.....1921
Brechwoldt, Leonard.....1922
Brockhoff, Lewis Paul.....1919
Bruun, Harold Nicholai.....1905
Burda, Stanislaus W.....1916
Burdick, Alfred S., M.D.....1913
Burdick, Merle M.....1913
Buss, Oliver C.....1915
Byers, Floyd Marion.....1921
Caldwell, A. C.....1915
Calomino, Anthony Francis.....1920
Canham, George E.....1915
Christensen, Henry C.....1906
Chwatal, John J.....1916
Clark, Albert Henry, Ph.G.....1905
Cochran, George Milton.....1922
Cohan, Jacob Joseph.....1918
Cohn, Matthew.....1922
Combs, Delta E.....1911
Corson, George.....1920
Covnot, Moses Philip.....1921
Crowley, James Patrick.....1908
Crystal, George Orlean.....1922
Crystal, Isidore Bernard.....1922
Curshan, Marcus.....1920
Davis, James S.....1922
DAY, WILLIAM BAKER, PHAR.M.1895
Di Cosola, Anthony.....1922
Dinnsen, Harry N.....1920
Doherty, Daniel Joseph.....1921
Donaberg, Sam B.....1921
Druehl, Amanda Stahl.....1916
Dubsky, Ella K.....1920
Dubsky, Frank J.....1918
Dubsky, Joseph E.....1918
Dyniewicz, Hattie Adela (Miss).1919
Dyniewicz, Josephine Marion (Miss) 1919
Eckart, Henry C.....1920
Eftax, Constantine S.....1920
Eisenberg, Ira Isadore.....1920
Erickson, Eric John.....1920
Fallon, Walter Raymond.....1921
Fantus, Bernard, M.D.....1908
Fenger, Frederic.....1910
Fingl, Anton W.....1920
Fox, Milton Mitchell.....1921
Friedlander, Benjamin.....1921
Froiland, Miss Dina.....1921
Fry, Herman.....1902
Fry, Narcys George.....1906
FULLER, OLIVER FRANKLIN.....1869

ILLINOIS.

Galloway, J. B.....1917
Gathercoal, Edmund Norris.....1905
Gazzolo, Frank Henry.....1917
Geisler, C. A.....1921
Gendreau, Albert Earl.....1922
Gibney, E. Paul.....1918
Ginsburg, Morris.....1921
Ginsburg, Sylvia (Miss).....1918
Gleich, Clarence Philip.....1922
Glick, Benjamin.....1921
Gordin, Henry Mann, Ph.D.....1899
Gordon, Jean (Miss).....1914
Gorham, Louis Andrew.....1921
Gray, James Herbert.....1921
Gray, Margaret McClintock (Mrs.).....1901
GRAY, WILLIAM.....1892
Griffith, Jesse Bower.....1922
Grossman, David P.....1921
Guinter, Seward Haise.....1920
Gundlach, Edward.....1920
Haering, Geo. V.....1918
Hart, John M.....1921
Hartwig, Otto Julius.....1892
Haselberger, Charles Frank.....1920
Hayson, Frank M.....1922
Hellmuth, Joseph Anthony.....1905
Henriksen, E. Fred.....1921
Henry, Samuel Clements.....1909
Hermanek, Joseph Charles.....1904
Hilpert, Willis Stose.....1908
Hirsch, Chas. H.....1921
Hodel, Elmer Martin.....1922
Hodel, Oscar Carl.....1922
Hoover, George William.....1905
Horn, George.....1921
Hunsche, Frederick.....1915
Hurdle, Glen F.....1921
Hynes, Jeremiah A.....1920
Irvine, Ephraim D.....1921
Janda, Joseph.....1921
Jaworski, E. W.....1920
Jennings, Ralph Crawford.....1915
Jensen, Harry Jesse.....1921
Johnson, Barney P.....1922
Johnson, J. Elmer.....1922
Jones, Rees D.....1922
Kachinskas, John T.....1921
Kaplan, Samuel Solman.....1918
Kara, Frank V.....1920
Katz, Isadore I.....1921
Kemp, Ervin F.....1920
Kite, Barney.....1921
Knight, Chas G.....1918
Knutson, Carl Werner.....1922
Kocharski, Stephen B.....1922
Kodera, James Charles.....1922
Kogon, S. P.....1918
Kolar, Gustav S.....1918
Kolar, Stanislav M.....1921
Kolb, Philip Jacob.....1918
Koller, Zdenek.....1922
Kovarik, Victor B.....1921
Kozlowski, Boleslaw.....1919
Kraemer, Frank W.....1918
Kraemer, George Charles.....1913
Krafft, Walter A.....1922
Krazunas, John Julius.....1922
Krizan, John.....1918
Krupkin, M. A.....1922
Kulis, Justin.....1921
Kunka, Henry Edmund.....1922
Kurrasch, Albert A.....1918
Lacy, Isham Lawrence.....1922
Ladish, Erich Herman.....1905
Larsen, L. P., Ph.G.....1908
Lauer, Wm. G.....1922
Lesser, Hyman N.....1920
Levinson, Leo. D.....1921
Levy, Russell Damon.....1922
Lilly, Thomas P.....1921
Linke, Richard Arthur Gustav.....1920
Loesch, William, Ph.G.....1912
McCabe, Frank J.....1920
McCausland, Harloven H.....1913
McCracken, H. S.....1918
Madera, Jaroslav Robert.....1920
Maether, Carl A.....1921
Maguire, Andrew.....1918
Mahon, Eber E.....1921
Mapes, Ralph Clark.....1921
Mares, Frank Martin, Ph.G.....1902
Martin, Lewis Elbert.....1921
MATTHEWS, CHARLES EDWARD.....1893
Mawrence, Israel.....1916
Meadows, Robert Clarence.....1922
Mendelsohn, Philip.....1922
Mendralski, Walter J.....1921
Mentz, Otto Herman.....1916
Merlak, Frank James.....1920
Meyer, Frederic Hugo.....1907
Miller, Albert, Ph.G.....1907
MINER, MAURICE A., PHAR.M.....1880
Morrisson, James William.....1912
Nichols, William Lee Crosby.....1920
Olsen, Egil T.....1921
O'Neill, Wm.....1918
Orr, Chas. C.....1922
Parks, George E.....1922
Patterson, Charles Waggener.....1905
Patterson, James A.....1921
Peck, Mrs. Wolfred W.....1922
Petranek, Joseph Louis.....1921
Pleasant, George Harrison.....1922

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Profant, Otto F.....1920
Puckner, William August, Ph.G., Phar.M., Phar.D.....1888
Quong, Louis Sing.....1922
Reader, James.....1922
Reiffel, Samuel Jack.....1921
Reinhard, Harold A.....1921
Rhode, Rudolph Ernst.....1887
Riemenschneider, Julius H.....1915
Rimmele, Charles.....1921
Robbins, Jennie.....1922
Robinson, Robert.....1920
Roeseler, William Theodore.....1921
Ruder, Rose Scheele (Mrs.).....1918
Rutledge, Edward Hays.....1921
Safranek, Edward J.....1920
Salem, Joseph D.....1922
Saltiel, Henry Carl.....1921
Sample, Leo E.....1921
Sass, Stephen Konrad.....1905
SCHERER, ANDREW, PH.G.....1884
Schmidt, Florian Joseph.....1918
Schmidt, Sidney.....1920
Schrage, Frank.....1918
Schulte, Norma-Claire.....1921
Schwaba, John.....1920
Schwartz, Fred I.....1922
Scott, Ingvard Martinius.....1920
Searle, C. H.....1918
Secord, George Louis, M.S., Phar.D. 1910
Shapiro, Leo Harold.....1917
Sheblessy, Michael Albert.....1909
Silberman, I. Erwin.....1921
Siskel, Maurice.....1921
Sisson, Oscar U.....1918
Sister Mary Wilhelmina.....1919
Skoglund, Herbert.....1921
Skowron, John D.....1922
Smith, Herman Philip.....1922
Snow, Clyde Mason, Ph.G., M.A.1903
Snyder, Forrest Omo.....1915
Snyder, William Edward, Ph.G.1909
Solomon, Joseph D.....1922
Sorenson, Adolph Waldo.....1921
Spagna, Ferdinand A.....1921
Stadelmann, Arthur W.....1918
Stadelmann, Harry Edgar.....1909
Stanczak, Stanley L.....1921
Stein, Victor M.....1921
Stephan, Arthur Harry.....1921
Stephen, Otto Paul, Ph.G.....1909
Stern, Lester M.....1922
Stieber, F. G. J.....1918
Storer, Charles Adelbert.....1906
Stuchlik, John.....1913
Subert, George Anton.....1921
Swanson, Joseph Allen.....1919
Sweeney, John P.....1922
Sykora, Edward.....1921
Tabenski, Longin, Ph.G., M.D..1915
Taylor, Daniel.....1920
Thayer, Robert C.....1922
Thomas, Arthur B.....1922
Thompson, Charles Samuel.....1921
Topf, Jacob A.....1918
Toy, Wing.....1922
Train, Maurice A.....1921
Tumas, John.....1922
Unger, Paul.....1922
Vanderpoel, Cornelius.....1921
Van Schaack, Cornelius Peter..1905
Vaupell, George F., Ph.C.....1915
VOISS, ARCADIUS.....1901
Von Hermann, Eugene.....1918
Vorsanger, Lillian.....1915
Warner, Carl A.....1919
Warren, Lewis Eugene.....1909
Weiss, Louis Ralston.....1921
Weiss, Sydney.....1921
Wheatcroft, John Christopher...1912
Whidden, Ray Allen.....1918
Whitney, Maxson Hall.....1921
Wieczorek, Walter W.....1921
Wiertelak, Albert P.....1921
Wilhelm, Werner F.....1919
Wilson, Harvey E.....1922
Wolfe, Cecil Dewey.....1922
Wolff, Fred.....1921
Zahajkiewicz, Vincent.....1922
Zaleski, Rufus E. G.....1922
Zoeller, Geo.....1918
Zurawski, Narcys Joseph.....1922

Cicero.

Karel, Louis.....1920
Malinsky, George Anton.....1921
Plzak, Louis Frank.....1921
Prihoda, John F.....1922

Cowden.

Jones, Harold V.....1919

Danville.

Baum, William Franklin.....1915

Decatur.

Kelch, Henry Carl.....1921

Des Plaines.

Merrill, Fayette O.....1920

Dixon.

Sterling, Robert W.....1920

East St. Louis.

Merker, Chas. F.....1920

ILLINOIS.

Edwardsville.

Delicate, E. A.....1920

Elgin.

McBride, Stanley Edward.....1920
Schultz, Charles Frederick Wm..1911

Elmhurst.

Kappus, George J.....1920
Mahler, Wm. H.....1920

Evanston.

Doolittle, Roscoe Edward, B.S..1909
Lee, John Victor.....1910
Wells, James Herbert, Ph.G., LL.B. 1908

Fairbury.

Decker, W. B.....1920

Fairmont.

Tilton, Claude Enoch.....1905

Forest Park.

Jacob, Herman Ferdinand.....1920

Forreston.

Haller, Edward E.....1920

Freeport.

Lawson, Chas. E.....1916
McNess, Frederick Wm., P.D...1906

Galesburg.

Hamilton, Lew Brown.....1920

Geneseo.

Ahnert, Max E.....1921
Stamm, Dante Milton.....1896

Glencoe.

Clyde, Albert Eugene.....1922

Glen Ellyn.

Utt, Alfred Reuben.....1919

Greenup.

Conzet, Rufus Warren.....1904

Herrin.

Skelton, Maurice B.....1919

Highland Park.

Gesell, Earl W.....1917

Hillsboro.

Spinner, Louis Charles.....1921

Hinsdale.

Reynolds, Harry Louis.....1922

Jacksonville.

Armstrong, Byron.....1917

Jerseyville.

Kirby, Thomas Wesley.....1920
Ware, F. M.....1920

Joliet.

Lipow, Diana.....1920
Moss, Francis C.....1922
Schick, Sebastian Fabian.....1918

Lake Bluff.

Young, Fred H.....1913

Lake Forest.

Krafft, Carl L.....1922

LaSalle.

Clancy, William J.....1915

Lincoln.

Knochel, George M.....1920

Litchfield.

Barton, Paul Elzevir.....1921

Lombard.

Bradley, James F.....1921
Hjelte, John E.....1922

McHenry.

Petesch, N. H.....1922

Metropolis.

Van Hooser, Arthur.....1920

Moline.

Anderson, Adolph Emil.....1913
Doden, J. R.....1918
Sohrbeck, George Wm., Ph.G...1897

Momence.

Blomquist, Arthur 1919

Mulberry Grove.

Humphrey, Allen 1920

Mound City.

Koontz, Victor Earl.....1922

Mt. Pulaski.

Connolley, Virgil George.....1920

Neponset.

Higgins, Charles Louis.....1920

Oak Park.

Huston, Lotis Loma.....1918
Latsis, Harry Hlia.....1920
McCauley, Charles Edward.....1903
Rambo, Leon 1921
Stoyanoff, Nicholas D.....1922
Wakefield, T. S.....1920
Zwick, Mary Hall (Mrs.).....1914

Orient.

Buerkle, Henry A.....1920

Ottawa.

Dougherty, Joseph Downey.....1922

Park Ridge.

Petranek, Charles Wesley.....1922

Pearl.

Garrison, H. Daley.....1920

Peoria.

Benton, Wilbur Merritt.....1888
Eichenberger, William Samuel..1916
Geiger, Edward George.....1920
Lacey, W. D.....1920
LaGrange, John V., A.M., Ph.G.1905
Norris, William Peter.....1918
Owen, Clarence 1920
Schmid, Ernest A.....1920
Schmidt, A. Elsa.....1918
Weinkauff, Jacob 1914

Peru.

Robinson, Wesley John.....1921

Pesotum.

Hoffman, George Frederick, Ph.G. 1902

Prophetstown.

Fenn, Kenneth N.....1921

Quincy.

Bartholomew, Henry Hoagland.1920
Brown, W. Edwin.....1920
Dickhut, Lawrence August, Ph.G. 1910
Hagemann, William Herman, Ph.G. 1910
Konantz, William A.....1916

Ransom.

River Forest.

Windmueller, Ralph Wm.....1920

Rock Falls.

Stoner, Lloyd 1921

Rockford.

Carter, Willard Henry.....1922
Freburg, Amel E.....1920
Zuck, F. J.....1916

Rock Island.

Doden, Herbert F.....1909
Greenblatt, Benj. 1918
Hartz, William Theodore.....1909

Savanna

Law, G. Boyd.....1922

Sesser.

Gholson, L. E.....1920

South Chicago.

Wyszynski, Walter H.....1916

Sparland.

Formhals, Wallace Joseph.....1919

Springfield.

Dodds, Frederick Clinton.....1918
Gaffney, Randolph Ellison.....1920
Metzger, Fred W.....1916
Rauth, Fred W.....1920
Sister Theresa 1917
Sivia, Jerome 1920

Staunton.

Webster, Cyrus Christopher....1920

Streator.

Cate, Rollin L.....1920

Tuscola.

Stacy, Marion Franklin.....1903

Urbana.

Beal, George Denton.....1907
BEAL, JAMES H., SC.D., PHAR.D.1892
Bennett, George M.....1918
Creighton, Mary L (Miss).....1903

Waukegan.

Breves, Rudolph 1916
Link, Alexander J.....1917
Neville, Mark Eldon.....1921

West Frankfort.

Lishinsky, Mrs. R. Waitzel.....1922

Western Springs.

Keil, Julius Martin.....1920

Wheaton.

Dollinger, Charles A.....1920

Wilmette.

Renneckar, Clarence E.....1920

Winslow.

Niemeyer, John 1920

INDIANA.

Attica.

Crigler, Thos. B.....1922

Bloomington.

Wiles, Wood 1914

Bluffton.

Stout, Marion Alphon, Ph.G....1906

Broad Ripple.

Taylor, Irvan E.....1917

Converse.

Gift, Wendell J.....1913

Elkhart.

Beardsley, Andrew H.....1913

Evansville.

Bohn, George W.....1907
Eberle, Herman Theodore.....1901
Hardigg, William L.....1913
Rogers, Edw. 1902

INDIANA.

Gary.

Hanley, Harry G.....1920
Honorof, Peter 1918
Kobylanski, John Francis.....1918
Meyer, Frank B.....1918
Sampanis, Argirio Georges.....1920

Goodland.

Cooke, Lawson J.....1922

Hammond.

Ostrowski, Bernice A.....1920
Smith, Ira J.....1921

Indianapolis.

Bartholomew, William C.....1913
Bibbins, Francis Eugene, Ph.G...1909
Blodau, Robert P.....1908
Borst, Harry J.....1917
Burrin, Philo LaMont.....1919
Carter, Edgar B.....1916
Carter, Frank Henry.....1891
Carter, Harlem Wilson Searight.1913
Eberhardt, Ernest Godlove, Ph.G. 1906
Eckler, Charles Ralph.....1903
Etter, Robert B.....1917
Fisk, Frank Byron.....1916
Hall, Albert B.....1922
Huder, Henry J.....1894
HURTY, JOHN NEWELL, M.D., PHAR.D. 1882
Kassulke, August.....1905
Keene, Bernard M.....1918
Leth, Eric Gunnar.....1916
Lilly, Eli 1906
Lilly, Josiah Kirby.....1890
Lilly, Josiah Kirby, Jr.....1916
Lynn, Charles Jackson.....1906
Miller, Ivy Lowell.....1912
Mueller, J. George.....1906
Niles, Edward Hulbert.....1914
Noel, Harry Sumner.....1917
Pfafflin, Henry Adolph.....1892
Pruyn, Murry K.....1912
Reick, Edward C.....1918
Rhodeland, Harley Wesley.....1922
Rice, Ward Jennings.....1920
Seybert, John Edward.....1916
Showalter, Ralph W.....1913
Smith, Herbert Alexander.....1917
Stahlhuth, Ernst 1919
Stucky, Edward W., Ph.B., A.M.1908
Thorburn, Albert David.....1902
Thurston, Emory W.....1915
Vestal, John Wilfred.....1916
Warner, Cortice M.....1916
Werner, William F.....1908
Wright, John Shepard.....1916

Lafayette.

Best, Frank Merrell.....1914
Jordan, Charles B., Ph.C., B.S., M.S. 1909
Lee, Charles O.....1915
Yeager, Emory James.....1918
Zufall, C. J.....1919

La Porte.

MEISSNER, FREDERICK WILLIAM, JR., PH.G. 1890

Logansport.

Hoffmann, George William.....1904

Martinsville.

May, Edwin W.....1914

Notre Dame.

Green, Robert Lee.....1906

Rushville.

Wilson, Charles Frazee.....1906

Salem.

Rudder, William Hiram, Ph.G...1907

Seymour.

Loertz, Carl Edward.....1907
Osterman, Henry 1914

South Bend.

Reyer, Emil, Ph.G.....1907
Tomaszewski, Marian 1920

Terre Haute.

Zimmerman, Theophilus 1914

Troy.

Gaesser, Theobald Theodore, Ph.G. 1901

Valparaiso.

Battershell, Russell Reed.....1922
Carpenter, Allie Thomas.....1921
Cox, Cyrus L.....1919
Heineman, Albert F.....1905
Muldoon, Hugh Cornelius, Ph.G..1913
Peschel, Peter L.....1921
Schicks, George Charles, Jr.....1921

West Lafayette.

Gidley, Wm. Francis, Ph.C., B.S. 1910

West Terre Haute.

Cassaday, Burton 1909

Whiting.

Frankowski, Matthew Henry...1922

Winchester.

Reed, Charles E.....1922

IOWA.

Albert City.

Werner, Carl Ali Anderson.....1922

Algona.

Falkenhainer, Albert 1916

Allerton.

Heiston, Percy K.....1921

Amana.

Miller, Frederick William.....1902

Ames.

Judisch, George 1913
Motley, Emery Tyler.....1920

Bagley.

Phillips, William J.....1921

Battle Creek.

Rickman, Elmer Henry.....1921

Burlington.

Sutter, Raymond Otto.....1922

Callendar.

Larson, Martin 1906

Cedar Rapids.

Beezley, Ernest L.....1921
Fencel, Frank N.....1922
Grimm, Harold A.....1920
Meister, Edward James.....1918

Clarinda.

Meyer, Marie Verena.....1921

Clinton.

Hendrix, Norburg Thornton....1921

Council Bluffs.

Geise, Maude V.....1922

Corydon.

Shepard, Mrs. Anita.....1921

Davenport.

BALLARD, JOHN WINTHROP, PH.G. 1871
Denniston, Myron D.....1921
Emlis, Arno F.....1922
Neufeld, John 1922
Ross, Otto Ellsworth, Ph.C., Ph.G. 1908
Wertz, Eddie M.....1921
Wierks, Clarence 1918

Deep River.

Cutler, Chester F.....1922

Denver.

Schoof, John F.....1922

Denison.

Schlumberger, Anna Babette....1913
Schlumberger, Philip August...1911

Des Moines.

Albrecht, Albert 1918
Berner, Carl Albert.....1903
Cameron, L. Catharine.....1922
Galloway, J. Earle.....1922
Heidenrich, Arthur C.....1916
Kagy, Elbert O., Ph.G., Ph.C...1913
Stedman, Harry A.....1921
Weeks, Carl 1915

Dyke.

Anderson, Marius 1921

Dubuque.

Zillig, Adam 1922

Dunlap.

Hart, Willard Ronald.....1922

Elkader.

Witt, Wm. John.....1921

Elma.

Gross, E. Orville.....1916

Estherville.

Moser, Carl Amanuel.....1921

Essex.

Bergen, Seth A.....1921
Newquist, Mabel Margaret.....1922

Ft. Dodge.

OLESON, OLAF MARTIN.....1877

Ft. Madison.

SCHAFER, GEORGE HENRY... 1871

Gilbert.

Jones, Ralph A.....1921

Gladbrook.

Foster, Harry Wallace.....1921

Grand Junction.

Hodoval, Louis C.....1921

Granville, Sioux Co.

Bachmann, Joseph 1922

Grinnell.

Talbott, Arthur D.....1922

Hamburg.

Doyle, Clarence Edward.....1922

Hedrick.

Scott, Raymond Earl.....1921

Holstein.

Watts, Thomas McCoy.....1916

Homestead.

Moershel, William August.....1921

Hospers.

Riemersma, James J.....1921

Inwood.

Mcgell, Albert Lawrence.....1922

Iowa City.

Bickal, S. L.....1921
BOERNER, EMIL LOUIS.....1877
Cooper, Zada Mary (Miss), Ph.G. 1909
Hazard, Clarence C.....1921
Kuever, Rudolph A., Ph.G., Ph.C. 1912
Morrison, Sherman William.....1922
Roberts, Miss Jane E.....1922
Teeters, Wilber John.....1902
Weiss, Josephine Mary.....1920

Keokuk.

Kiedaisch, George Arthur.....1904

Little Rock.

Osterman, Harry R.....1921

Mt. Pleasant.

Waugh, Herbert 1922

Manchester.

Philipp, August C.....1921

Muscatine.

Halstead, Alice Louisa, Ph.G. (Mrs.) 1892

Newmarket.

Taylor, Glen O.....1921

Nevada.

Tipton, Wm. L.....1922

Newton.

Nollen, G. H.....1922

Odebolt.

Bergren, Elvin R.....1916

Oelwein.

Pfeiffer, H. Jacob.....1922

Oscela.

Heinrich, Geo. A.....1922

Otley.

McKeever, Ren V.....1922

Paullina.

Blaesser, Walter Andrew.....1920

Pleasantville.

Dixon, Clyde Peon.....1921

Rock Valley.

Brake, Bert Vande.....1921

Sheldon.

Lutjens, Louis H.....1921

Sioux City.

Castle, Lloyd H.....1922
Hansen, Otto Theodore.....1922
SCHERLING, GUSTAV, PH.G.....1884
Singer, A. F.....1922
Soper, George M.....1909
Thompson, Edwin Thomas.....1913
Toller, Adolph J.....1915

Traer.

Caslavka, Lewis Bennett.....1921

Underwood.

Cosh, W. Frank.....1921

Valley Junction.

Carmody, Wm. Henry, Jr.....1922

Victor.

Gwinn, E. H.....1921

Wallace.

Steward, Charles Robert.....1921

Waterloo.

Hansen, Hans Tunis Schantz...1922
Moore, Thomas James.....1922

West Bend.

Hofstadter, Anna 1921

West Branch.

Larson, James E.....1921

Winfield.

Lindley, John Milton, Ph.G.....1901

Yale.

Stotts, O. D.....1922

KANSAS.

Atchison.

Noll, Mathias 1918
Schmitz, Oscar Joseph.....1920

Concordia.

Sorgatz, Francis F.....1920

Downs.

Arnold, Peter Elwood.....1920

Emporia.

Morris, David Warren.....1921

Galva.

McEckron, George Milton.....1916

Gypsum.

Schmitter, Jonathan.....1918

Havana.

Lindley, Patrick H.....1913

Hiawatha.

Brokaw, Rymar Voorhees.....1920

Lawrence.

Chiang, Willson Ying.....1922
Havenhill, L. D.....1900
Kerr, Archibald Victor.....1921
Moore, John Thomas.....1888
SAYRE, LUCIUS ELMER.....1883
Spencer, Daniel Hooker.....1920
Sterling, Charles Morgan, A.B..1911
Watson, George Nathaniel.....1910

Leavenworth.

Snyder, Leo J.....1921

Marysville.

Riesen, David V.....1909

Stark.

Deem, David F.....1920

Wichita.

Chism, John Samuel, Ph.G.....1909
Cookson, Ellis Wesley.....1921
Fields, J. Larkin.....1915
Wuester, Mary C.....1920

Winfield.

Bird, Richard B.....1910
Friedenburg, Maximillian Wilmer 1904

KENTUCKY.

Anchorage.

Hausgen, Henry Otto.....1915

Augusta.

Bertrams, Henry.....1914

Bellevue.

Wyman, Lloyd Rodney.....1920

Carlisle.

Watkins, Esla Kennedy.....1921

Covington.

Kyser, Edward Vernon.....1918
Pieck, Edward Ludwig.....1897

Frankfort.

Gayle, John William.....1891

Hawesville.

Patterson, George Orville.....1907

Irvine.

Lynch, Owen M.....1921

Jeffersontown.

Oatey, Ernest 1920

Lexington.

Brown, Linwood Arnold, Ph.C., Phar.D. 1909
Porter, Chilton Scott.....1914

Louisville.

Buschemeyer, Henry.....1909
Dilly, Oscar Charles.....1888
Dimmitt, Addison.....1895
Hulskamp, Clara C.....1918
Hurley, Horace Oliver.....1907
Isaacs, Edward Gibson.....1920
Miersch, Rudolph Victor.....1907
Mueller, Otto Edward.....1907
Stoll, Ferdinand Dyonize.....1920
Votteler, William.....1895

Moorehead.

Townsend, Fred S.....1922

Newport.

Blank, Nicholas J.....1915
Gruele, Albert Martin.....1903
Hoyer, Benjamin.....1916
Widrig, T. J.....1915

Owensboro.

Danhauer, William Edward.....1914

Paris.

Snapp, Elbridge Lee.....1920

LOUISIANA.

Alexandria.

Joseph, Edward Isaac.....1921

Algiers.

Calderone, Frank Joseph.....1921

Arcadia.

Brewer, Bert Augustus.....1921

Donaldsonville.

Holbrook, E. Bradford.....1921

DeRidder.

Irvine, Frank E.....1921

Gilliam.

Whitley, J. F.....1921

Independence.

Wilson, William M.....1921

Kaplon.

Eleazar, E.....1918

Mandeville.

Stockton, Louis A.....1921

Merryville.

Smith, Denette Weymouth.....1919

Monroe.

Collens, John W.....1915
Sandman, Isaac Percy.....1921

Napoleonville.

Heno, Charles.....1921

New Orleans.

Addison, Daniel Geo.....1921
Aimes, Fred W.....1921
Allen, Marion.....1921
Baumann, George F.....1921
Bergeron, Gilbert O.....1922
Berner, Joseph Henry.....1921
Besse, Fred, Jr.....1921
Bosio, Arthur.....1920
Bowee, John R.....1921
Bouvier, Clovis J.....1921
Breen, Morris.....1921
Breslin, Arthur E.....1921
Brown, Geo. S.....1922
Brown, Hugh A.....1921
Capdan, Hypolyte E.....1919
Casteix, Martial B.....1921
Catalano, A.....1921
Catalano, John.....1921
Clay, Cassius Lovelace.....1918
Commagere, Louis E., Jr.....1921
Coochiara, Anthony S.....1921
Danneker, John Martin.....1922
D'Aunoy, Jerome Emmanuel....1921
Doucet, W. E.....1921
Duplantis, Wilsey P.....1921
Elmer, Oscar Baker.....1918
Flach, August Charles.....1921
Freund, Paul.....1917
Galle, Joseph Ernest.....1921
Godbold, Fabius Chapman.....1887
Graser, John J.....1918
Hart, E. J.....1921
Jacobs, Elliott.....1921
Jahn, Mrs. Margaret.....1920
Jensen, Roy C.....1921
Kaczoroski, Adolph O.....1909
LeBlanc, Lawrence J.....1921
Legendre, Joseph Amilcar.....1891
Loubat, Walter L.....1921
Lyons, Lucien Eugene.....1904
McDuff, George W.....1921
Morvant, John S.....1921
Nuccio, Frank Joseph.....1918
Nutter, Albert M.....1919
Otto, John Nicholas Washington.1919
Richards, Henry Cook.....1921
Robert, James L.....1921
Samson, Max 1900
Schertz, Christian 1916
Treece, Wilfred W.....1921
Walsdorf, Edward H.....1904
Welsch, Henry.....1916
Whisenhaut, Nathaniel Lyon....1921
Wirth, Adam, Ph.M.....1904
Worner, William August.....1921
Wunderlich, Edward.....1891

Plaquemine.

Comeaux Albert J.....1921

Shreveport.

Pachomius, Sister Mary.....1922

Slidell.

Cohen, Harry 1921

Winnfield.

Brorch, Mach Lunsford.....1920

MAINE.

Auburn.

Jones, Oscar Winthrop.....1902

Augusta.

Coughlin, John 1908

Bangor.

SWEET, CALDWELL.....1881

Biddleford.

Fortin, Emile A., M.D.....1916

Danforth.

Porter, Martin Luther, M.D....1904

Dexter.

Bullard, Morton Leonard.....1917

Fort Fairfield.

Buxton, Horace Childs.....1910

Houlton.

Saunders, Vernon Dewellyn....1921

Kennebunk.

Meserve, Albert Wesley, A.M., B.A. 1905

Lewiston.

Babcock, Percival Warren.....1909

Portland.

Broe, James Augustin.....1917
Cook, Alfred Page.....1902
Dickson, Edmond C.....1921
Hay, Edward Allston.....1899
Rankin, George W.....1915
Tuttle, George O.....1907

Presque Isle.

Anderson, Ellerth Wm.....1922

Richmond.

McKenney, Frank Roy.....1914

Sanford.

Thompson, Clarence.....1920

South Paris.

Howard, Chas. H.....1915

Waterville.

Davian, Emile Hector.....1921
King, Fred.....1921

Yarmouthville.

Ring, Harry E.....1916

MARYLAND.

Baltimore.

Albert, Arleigh Hubert.....1922
Barone, James A.....1922
Base, Daniel, A.B., Ph.D.....1898
Belbot, Emma N.....1922
Black, James Aitken, Phar.D....1910
Borcherding, Wm. E.....1922
Boucsein, Wm. Geo.....1922
Boyles, Frank Morris.....1914
BRACK, CHARLES EMIL.....1876
Burroughs, Horace, Jr.....1921
Cole, Bessie Olive (Miss).....1915
Colson, Henry C., Jr.....1917
Cook, Parker.....1910
CULBRETH, DAVID MARVEL REYNOLDS, M.D.....1883
Dickson, Frederick W.....1906
Dohme, Alfred Robert Louis...1891
Donnet, John Smith.....1915
Dunning, Henry Armit Brown, Phar.D. 1902
Englehardt, Hermann.....1907
Fouch, William M.....1906
Frames, John Fuller, Ph.G.....1890
Gaver, Gaither C.....1921
Gilpin, Henry Brooke.....1889
Grantham, Richard I.....1922
Hancock, James Etchberger.....1907
HANCOCK, JOHN FRANCIS.....1863
Harris, Samuel Y.....1920
Hetz, Geo. P.....1922
Hetz, Edwin.....1921
Heuisler, Philip Ignatius.....1903
Hewing, A. N.....1922
Hindes, Joseph Frey.....1910
Hirzel, Herman 1922
Hodson, Eugene Withers.....1907
Kammer, Wm. H.....1922
Kantner, Leahmer M.....1914
Kelly, Evander Frank, Phar.D..1905
Kranz, John Christian, Jr.....1920
Lowry, William J., Jr.....1906
Marmon, Leon.....1922
Meyer, Charles Lewis.....1901
Moose, Walter Lee.....1920
Morgan, Charles 1899
Morris, Eugene G.....1922
Mosop, Carrie Gray.....1920
Muehlause, Otto W.....1915
Murphy, Jerome Edward.....1922
Muth, John Clement.....1898
Neal, Charles Chaplin.....1906
Patterson, Anne M.....1915
Pensel, Wm.....1922
Roberts, Jos. C.....1910
Schucolter, Morris E.....1920
Schulze, Louis, Ph.G.....1892
Schulze, Wilmer H., Phar.D....1916
Shannon, Donald A.....1922
Smith Theodoric.....1890
Sonnenburg, Amelia Adelaide...1918
Stickles, Arthur Elmer.....1920
Sullivan, John Patrick.....1909
Thomas, John Benjamin.....1906
Walz, Jacob Lee.....1906
Westcott, James Walling, Ph.G.1890
Wich, Henry Edward.....1909
Williams, Lawrence Soper.....1910
WINKLEMANN, JOHN HENRY....1864
Woehner, Walter Albert.....1918
Wolf, Charles Augustus.....1906
Wolf, James Carlton.....1905

Cumberland.

Holtzmann, Charles Hanson.....1911

Frederick.

Pearre, Albert Lindsay.....1906
Williamson, Thomas M.....1916

Frostburg.

Pearce, George Ellsworth.....1911

Hagerstown.

Meredith, Harry Lionel.....1900
Schindel, David P.....1914

Mt. Ranier.

Spire, William Barton, Phar.D..1908

Salisbury.

White, Edward Riall.....1911

Snow Hill.

Powell, William Cottingham....1895

Sykesville.

Swain, Robert Lee.....1909

Taneytown.

McKinney, Robt. Sentman, Ph.G.1898

MASSACHUSETTS.

Allston.

Griffin, Lyman Whiting.....1907

MASSACHUSETTS.

Beverly.

Delaney, Thomas F.....1910

Boston.

Amrhein, Florin Joseph.....1915
Bradley, Theodore James.....1896
Burnett, Benjamin G.....1922
Burnham, Alfred Augustus, Jr..1891
Cadora, Joseph G.....1921
Capetanakis, Demetrios Christow 1920
Crowell, Harvey Van Rensselaer 1922
Doliber, Franklin W.....1914
Ewing, Clare O.....1918
Finneran, James Francis.....1906
Geddes, Lillian M. (Mrs.).....1912
GODDING, JOHN GRANVILLE, PH.G.1875
Godsoe, Joseph.....1922
Goodwin, Howard.....1910
Hunt, Reid.....1904
Kronberger, Alfred Milton.....1922
Lyons, Michael Francis.....1910
McIntire, Martin J.....1910
Merrill, Edward C.....1914
Mondello, Paul.....1920
Monnier, Ernest.....1913
Montieth, J. Drummond.....1922
O'Brien, James M.....1910
Sister Mary Gabriel Conerton...1922
Smith, Howard Harry, Ph.G., M.D. 1911
Staehli, Theodore Hermann.....1912
Tailby, J. Allen.....1918
Tobin, John J.....1914
Vargas, Heredis Jorge.....1891
White, Benjamin.....1921
White, Joseph Leyden.....1909
Wiggin, Harry Carleton.....1910
Woodward, Seymour Eastman..1920
Wooten, Thomas Victor, Ph.G..1893
Yaffe, Joseph Philip.....1921

Brighton.

Sister M. Alice.....1922

Brookline.

Clapp, Lowell Tuckerman.....1905
Gammon, Irving Parker.....1906
Glancy, John Douglas.....1913
Hitchcock, Charles H.....1910

Cambridge.

Acheson, Wm. R.....1910
Gilland, Charles E.....1921
Hawthorne, Herman Francis...1909
LaPierre, Eli Henry, Ph.G.....1892
Norton, George Edward.....1895
Olive, George M.....1911
SHARPLES, STEVEN PASCHALL, S.B. 1875
Stover, Charles Albert, Ph.G...1909
Thompson, Jennie Elizabeth.....1921
Thompson, Leon Albert, Phar.D.1907

Chelsea.

Armstrong, Thomas Call.....1915
Greeley, Randall Horace.....1920
Marmon, Samuel Manuel.....1920

Clinton.

Burdette, Bernard Clarence.....1911

Concord Junction.

Miller, Gladys B.....1922

Cordaville.

Follensby, Edna Mildred (Miss).1918

Dorchester.

Archer, Frederick.....1913
Kupperstein, Benjamin Robert..1921
Steinberg, Leo David.....1920
Williamson, Gordon James.....1921

Dorchester Center.

Coleman, George Edward.....1912

East Boston.

Bemis, Robert Edson.....1921
PACKARD, CHARLES HERBERT.....1906
Woodside, Alva Melville.....1921

Edgartown.

Beetle, Susan Russell.....1921

Everett.

Wagner, Arthur Carl.....1907

Fall River.

Brunelle, Albert Joseph.....1910
Corrigan, Dominick F.....1912
Sharkansky, Eugene Louis.....1918

Fitchburg.

ESTABROOK, HENRY ARTHUR.....1886

Gloucester.

Barker, Fred A.....1914

Hathorne.

Richardson, Norris H.....1922

Holyoke.

Heinritz, Lebrecht Gustav.....1902

Hopedale.

Earle, Wilfred.....1922

Hudson.

Wheeler, Carlton Bancroft, Phar.D. 1907

Hyannis.

Hawley, Norma C.....1916

MASSACHUSETTS.

Jamaica Plain.

Lewis, Ernest Grant.....1892
Lewis, John Grant.....1921
Smith, Linville Holten.....1892

Lawrence.

Call, Harry Barrett.....1909
Glover, William Henry, Ph.G...1891
Penn, Abraham.....1922
Penn, Maurice.....1922

Leominster.

Nixon, Charles Frederick, Ph.G..1900

Lowell.

Osgood, Winthrop Bancroft.....1920

Lynn.

Ellis, Leon Clifton.....1918
Gannio, Michael.....1921
Kreisser, Samuel Morris.....1921

Marlboro.

Morse, Harry F.....1921

Mattapan.

Kagan, Zusya.....1922

Melrose.

Wolff, D. O.....1916

Milford.

Pederzoli, Charles Arthur.....1921

New Bedford.

Curry, Geo. Francis, Jr.....1920
Guinn, Rosamond Alice.....1920
Robert, Camille Joseph.....1920
SHURTLEFF, ISRAEL HAMMOND...1875

Newburyport.

Davis, Charles Leland, Ph.G....1897

Newton.

Burke, Bernard M.....1920

Newton Center.

Hahn, William.....1910

North Boston.

Engstrom, Ernest Oscar, Ph.G..1906

Norwood.

Brooks, Frederick Pratt.....1914

Quincy.

Hearn, Charles Carroll.....1920

Roslindale.

Peterson, Ralph Carl.....1921

Roxbury.

Hailer, Fred C.....1922
Hershenson, Bert Barnet.....1921
O'Hearn, Katherine E.....1920

Sagamore.

Adams, James Holmes.....1906

Shelburn Falls.

BAKER, EDWIN.....1875

Somerville.

Grover, George Elmer.....1910
Murphy, John Thos.....1922

Southbridge.

Hartwell, Geo. Henry.....1914

Springfield.

Leonard, Edward Fenno.....1909
Lerche, Albert E.....1913
Merkle, Dorothy.....1921
Sorel, Arthur C.....1922
Thompson, Clifford R.....1916

Stoneham.

Charkoudian, Leon Nahabel.....1918
Emerson, Herman Lincoln.....1911
PATCH, EDGAR LEONARD, PH.G...1872

Taunton.

Crossman, George A.....1872

Three Rivers.

Horgan, Dennis J.....1922

Upham's Corner.

Lourie, Samuel.....1920

Uxbridge.

Gunn, George Baylies.....1917

Waltham

Gleason, Patrick Sebastian.....1904
Twombly, A. P.....1918

Watertown.

Sugar, Alice Louise.....1920

West Medford.

Shedd, Edwin Walter.....1910

West Roxbury.

Chase, Frederic Burton.....1922
Sumner, Jennie Henrietta (Miss), Ph.G.....1909

Winchester.

Knight, Frank Herbert, A.B., Ph.G. 1909

Winthrop.

Stover, Wm. Francis.....1914

Worcester.

Beaulac, Leo Armand.....1921
Brewer, Howard Dickinson....1902
Fausnaught, James Cherry.....1920
Fenwick, Harold Benson.....1921
Flint, William S.....1909
Guerin, James Francis.....1898

MICHIGAN.

Ann Arbor.

Collins, George Wm.....1911
Glover, Clifford C.....1913
Haarer, Oscar.....1917
Ivanoff, Petko Lazaroff.....1913
Stocking, Charles Howard.....1914
Swift, Byron W.....1922
Vahlteich, Hans Walter.....1918
Wagner, Leonard R.....1915

Big Rapids.

Jones, Mervin A.....1920

Buchanon.

Wisner, Ebert H.....1914

Chelsea.

Palmer, John A.....1922

Coldwater.

Wisner, Arthur George.....1909

Detroit.

Allen, Frank M.....1921
Anguish, J. Harold.....1922
Behrens, Wilbur J.....1921
Bertram, E. O.....1915
Bialk, Bernard A.....1922
Black, Roderick T.....1921
Briggs, Clifton Henry.....1914
Burniac, Joseph J.....1921
Buzzell, Arthur L.....1919
Bye, Mortimer.....1916
Campbell, James Clayton.....1919
Chase, Walter M.....1915
Chostner, Grover Cleveland.....1921
Cleland, Henry.....1922
Colby, William Frederick.....1921
Crandall, Ernest R.....1920
Dox, Howard Stanley.....1920
Drugociu, Nicholas.....1915
Early, James B.....1922
Ebner, Frank Gannon.....1918
Edmonds, B. P.....1917
Farwell, Oliver Atkins.....1912
Field, Edward K.....1922
Francis, John Miller, B.S., M.A.1906
Frank, Sigmund.....1920
Gilbert, Rolland J.....1920
Gorenflo, Oscar William.....1909
Graber, Howard T.....1915
Gratton, Geo. F.....1921
Grommet, Geo. H.....1915
Hall, William Alanson.....1888
Hamilton, Herbert C., Chemical Engineer.....1912
Hayward, Lawrence Barnes.....1912
Hebding, Arthur Frank.....1922
Houghton, Elijah Mark, Ph.C., M.D.....1889
Ingram, Frederick Fremont, Jr..1914
Jones, Ernest Ray.....1915
Kaminski, William A.....1919
Kamm, Oliver.....1921
Kimmich, Ernest.....1914
Knorr, Edwin Carl.....1922
Kratz, Everett W.....1922
Lakey, Roland T.....1920
LYONS, ALBERT BROWN.....1885
Mallard, Albert E.....1907
Mann, Charles Frederick.....1903
Mason, Harry Beckwith.....1896
Mitshkin, Mark D.....1915
Moore, John C.....1920
Moyer, A. E.....1913
Nelson, Edwin Horatio.....1904
OHLIGER, LOUIS PHILIP.....1871
Ohliger, Willard.....1903
Pape, Fred Carl.....1921
Pomerance, Fully J.....1921
Prhybylski, Gerald M.....1922
Rohnert, Frederick.....1915
Root, Charles T.....1918
Rose, Earl Edward.....1922
Rowe, Lewis W.....1916
Russel, Jason L.....1922
Schaupner, John Philip.....1915
Schettler, Geo. M.....1914
Scott, Frank Genio.....1917
SCOVILLE, WILBUR LINCOLN.....1891
Seltzer, Leonard Adams, Ph.C..1899
Smith, Hallett Francis.....1922
Smith, William E.....1922
Spokes, Ray E.....1922
Stout, Esten P.....1922
Strand, Martin E.....1920
Suminsby C. Burrill.....1922
Taylor, Francis Owen, Ph.C....1912
Thompson, Frank Augustus, Ph.C.....1908
Van Poppelm, H. Walter.....1921
Vernor, James.....1866
Washburn, Crosby B.....1918
Weaver, Clarence Albert.....1909
Webster, John Hugh, Ph.G.....1911
Weed, Frederick G.....1922
Wegner, Otto William.....1921
Wheeler, Albert Alton.....1906
Wirth, Elmer H.....1920
Wruble, Milton.....1922
Zich, Theodore Albert.....1922
Zindler, Fred Lewis.....1922

Elk Rapids.

Winters, Arthur James.....1916

MICHIGAN—MINNESOTA.

Grand Rapids.

Jongejan, Cornelius Henry.....1910
Kirschgesner, William Carl, Ph.C. 1903
Middleton, Louis V.....1919
Vellema, Peter.....1915

Hamtramck.

Smailis, Joseph J.....1919

Hersey.

Delzel, J. T.....1915

Highland Park.

De Laurier, James S.....1922
Guffin, Harry Lewis.....1921
Konzelman, Theodore.....1919

Ionia.

Long, Dennis B.....1921

Jackson.

Way, James E.....1922

Kalamazoo.

Hall, George Chalmers.....1914
Light, S. Rudolph.....1914
Todd, Paul H.....1920

Lansing.

Moore, Maxwell S., Ph. G.....1917
Raquet, Wallace Allan.....1920

Mt. Clemens.

KRAEMER, HENRY.....1892

Muskegon.

Koon, Chas. S.....1915
Newman, Charles Hiram.....1922

Redford.

Bradt, Frederick.....1915

Saginaw.

Heim, William.....1916

MINNESOTA.

Atwater.

Larson, Ned L.....1920

Balaton.

Tenhoff, Charles J.....1920

Benson.

Clarke, Ward S.....1922

Blooming Prairie.

Paulson, Roy Grover.....1922

Blue Earth.

Borath, Emil H.....1920

Brainerd.

Wallen, Alvin U.....1921

Buffalo Lake.

Eckstein, A. J.....1920

Butterfield.

Hollenitsch, John W.....1920

Canby.

Hanson, Geo. E.....1922
Nygren, Richard E.....1922
Sather, Clarence.....1921

Canton.

Case, Westwood D.....1919

Chisholm.

Jacobson, Charles M.....1920

Clearwater.

Phillips, Jennie L.....1920

Cloquet.

Raiter, Roscoe O.....1921

Currie.

Kauffman, Dr. Jno. Howard.....1922

Dassel.

Busch, Wm. John.....1922

Delano.

Wittman, Albert W.....1922

Detroit.

Carman, J. A.....1922

Duluth.

Abbett, William Allen.....1901
Anderson, J. August.....1920
Byers, Benton Bayard.....1920
Grochau, Edward A.....1920
Jeronimus, Henry Jurgen H....1920
Scott, R.....1922
Sister Mary Vincent.....1922
Swanson, Atle E.....1922
Vincent, Sister Mary.....1922

East Grand Forks.

Kingman, Ignatius.....1917

Eden Valley.

O'Brien, Frank P.....1922
Scott, John Herman.....1918

Elgin.

Holton, Fred Addie.....1922

Fergus Falls.

Beise, John Henry.....1908
Lee, Evan C.....1920

Fertile.

De Mars, Gustave Jules.....1918

Forest Lake.

Bergh, Frank Charles.....1922

MINNESOTA.

Frazee.

Geisenheyner, Wm. O.....1922

Fulda.

Iverson, Ida.....1920
Johnson, M. G.....1917

Grand Rapids.

Whittemore, Lee A.....1920

Halstad.

Gilbert, Allen M.....1920

Hastings.

Sieben, Harry A.....1922

Hibbing.

Stein, Milton.....1918

Hopkins.

Smetana, William S.....1915

Kasson.

Anderson, Walter.....1920

Kimball.

Douglass, Addison C.....1920

Kirkhoven.

Ostlund, John L.....1921

Lake Park.

Nelson, John.....1918

Lewiston.

Neumann, John H.....1918

Lindstrom.

Elfstrand, Wilhelm.....1905

Litchfield.

Anderson, Charles August.....1920
Lofstrom, A. Ernest.....1920

Little Falls.

Brown, Charles Hall.....1920

Lonsdale.

Lexa, Anastacia M.....1922

Mabel.

Jones, Dilwyn W.....1918

Mankato.

Steiner, Frank A.....1918

Milan.

Opjorden, Claus K.....1922

Milroy.

Taplin, Clifford Florian.....1918

Minneapolis.

Allen, E. Floyd.....1885
Bachman, Gustav.....1905
Beadle, Charles Perry.....1920
Borovsky, Elizabeth.....1922
Bruce, Hallie.....1922
Danek, John Francis.....1895
Dargavel, J. W.....1917
Dooley, Daniel B.....1918
Erkel, Arthur George, Ph.C.....1910
Esterley, Theodor W.....1922
Fahlstrom, Adolph A.....1920
Fischer, Carl F.....1921
Fjeldstad, Alex H.....1920
Gamble, Stewart.....1897
Goldner, John E.....1918
Gregg, Henry H.....1920
Gregg, Henry Hamilton, Jr.....1922
Griffen, Truman.....1909
Hickman, Frank M.....1920
Huhn, Charles Hugo, Ph.C.....1905
Karnofsky, Charles F.....1918
King, George Alexander Newton.1892
Kline, A. J.....1918
Kruckeberg, Henry C.....1920
Kusterman, Fred G.....1918
Malerich, Elizabeth M.....1920
Netz, Charles Vail.....1919
Newcomb, Edwin Leigh, P.D...1906
Peterson, Hugo O.....1920
Petterson, Petter Gabriel.....1922
Rogers, Charles Herbert.....1914
Schackleford, Franklin T.....1922
Spiegel, Louis.....1920
Strimling, Abraham.....1919
Strimling, Wm.....1919
Stuart, Josephine A. Wanous (Mrs.).....1897
Sweet, William Herbert.....1905
Vogel, Vivian Vina.....1920
Wincott, Robert T.....1920
Wulling, Frederick John, Ph.G., LL.B.....1893

Montevido.

Arneson, Theodore A.....1918

Moorhead.

Tiegen, Hjalmar O.....1919

Moose Lake.

Biscoe, Thomas C.....1920

Mountain Lake.

Balzer, Solomon.....1920

New Prague.

Holec, Rose Louise.....1920
Piesinger, Marie A.....1920

North Minn.

Lonergan, Maurice Daniel.....1920

Olivia.

Mamer, Bernard.....1918

Owatonna.

Zamboni, Wm. C.....1922

Pierz.

Duncan, Raymond M.....1920

Pine River.

Allen, John Jay.....1920

Pipestone.

Cook, John Walter.....1920
Menzel, Max.....1915

Preston.

Remington, Porter B.....1920

Redwood Falls.

Gerstmann, Frank.....1921

Rochester.

Hoffman, Edward L.....1918
Judd, Cornelius M.....1918

Rush City.

Setter, Harry O.....1921

Sacred Heart.

Nordstrom, Edwin.....1920
Stenborg, William Alvin.....1922

Sandstone.

Coleman, John Harvey Chas.....1920

Sauk Center.

Dowswell, Oscar Winfield.....1922

South Haven.

Pedersen, Jeppe D.....1922

Springfield.

Yackel, Arthur J.....1920

St. Paul.

Aberwald, Louis James.....1918
Aldes, Antoinette.....1920
Burke, William E.....1920
Cohler, Sara B.....1920
Collier, William Kelley.....1892
Conger, Frederick Albert.....1907
Elfenbein, Harold Herman.....1922
FROST, WILLIAM ARTHUR, PH.G.1892
Fuchs, Edmund J.....1920
Greenwalt, Frances Marion.....1920
Hannaford, Foster.....1922
Heller, Charles T.....1906
Hermano, Ariston.....1922
Jelinek, John Peter.....1907
Johnson, Hans Martin.....1915
Karras, Myron A.....1920
Mandigo, Wm. R.....1922
McColl, Henry.....1910
Messing, Richard J.....1913
Muggenburg, Arthur A.....1922
Noyes, Charles Reinold, B.A.....1908
Podvolicke, Ralph H.....1922
Rietzke, Herman W.....1909
Rudeen, Carl John.....1920
Smith, Frederick Alfred Upsher, Ph.C.....1907
St. Clair, Wesley.....1920
Strate, Herbert A.....1917

Stillwater.

Booren, John, Jr.....1922
King, Ira Perkins.....1919

St. Cloud.

Carter, Benjamin Farrar.....1922
Molitor, Martin.....1918

Thief River Falls.

Bryant, David K.....1918

Two Harbors.

Falk, Charles Ferdinand.....1920

Tyler.

Vodheim, Joseph.....1917

Walker.

Upham, George Bliss.....1920

Warroad.

Lundbohm, Victor E.....1920

Watterville.

Guilbert, Oliver W.....1921

Westbrook.

Steiner, Wm. F.....1922

Willman.

Carlson, Arthur E.....1921

Winona.

Brown, Edwin A.....1918
Schneider, Wm. Joseph.....1922

Worthington.

Morland, Robert Lawson.....1909

MISSISSIPPI.

Arcola.

Lee, Luther Quincy.....1920

Artesia.

Cox, Alvin Conley.....1921

Corinth.

Wilson, Charles E.....1921

Fondren.

Pettis, William Eugene.....1922

Hattiesburg.

Jones, James E.....1922

Jackson.

Culver, John W.....1922

Hall, Edward J.....1918
Key, S. B.....1922
Waits, Chas. Forrest.....1922
Ward, M. E.....1922

Laurel.

Wallace, Lew.....1920

McComb.

Beard, John A.....1918

Meridian.

Kendall, Gus C.....1913

Pass Christian.

Hanson, Guy.....1921

Port Gibson.

SHREVE, JOHN ALEXANDER.....1880

Rosedale.

Henshaw, Wrennie Carroll.....1920

Tchula.

Herbert, W. C.....1922

Tupelo.

Thomas, Perry K.....1922

Union.

Carleton, Eugene Elias.....1921

University.

Faser, Henry Minor.....1910

Vicksburg.

Heckler, Michael Schuster.....1918
Rayner, Walter Holmes.....1922

Yazoo City.

Ellis, J. B.....1922

MISSOURI.

Boonville.

Mittelbach, William, Ph.G.....1891

Brunswick.

Bowen, Cyrus West, B.S., M.S., M.D., Ph.G.....1912

Cape Girardeau.

Miller, Edwin Alexander, B.Pd., Ph.G. 1912
Miller, Isaiah Benjamin.....1912

Centralia.

Garrison, Dayton Burt, Jr., Ph.G.1913

East Prairie.

Doyle, Robert A.....1914

Excelsior Springs.

Tindall, Henry Clay.....1918

Hornersville.

Bryant, John Wilson.....1920

Hunnewell.

O'Daniel, William Francis.....1921

Kansas City.

Amos, Wilber Stanton.....1908
Andrea, Edward J.....1920
Clarke, Bruce Edwin.....1920
Faxon, Henry D.....1920
Federmann, William Martin....1901
Fuller, James Cook.....1918
HESS, PAUL LUDWIG.....1892
Patty, F. Arthur.....1921
Sister M. Benedicta Kuynen....1922
Whitney, David Victory, Ph.G..1903
Whitney, Minnie M. (Mrs.)....1914
Wirthman, John George.....1903
Wirthman, Joseph Charles.....1903

Malden.

Metzger, Arthur S., Ph.G., Ph.C.1908

Marshall.

Llewellyn, Henry Duncan.....1915

Maryville.

Simmons, Thomas Egbert.....1922

Nevada.

Ballagh, Wilfred Thomas.....1901

New Madrid.

Hummel, John Andrew.....1901

St. Joseph.

Padula, Albert A.....1922
Rudolph, Bertha (Mrs.).....1919

St. Louis.

Allard, Herman Joseph.....1914
Ambler, Jessie H.....1914
Bebie, Jules.....1920
Blakeslee, Louis George.....1903
BOEHM, SOLOMON.....1871
Brewer, Justin Sewall.....1912
Buckland, Thomas A.....1914
Caspari, Charles Edward.....1902
Claus, Otto Ferdinand, M.D....1901
Coussens, Bettie Prince (Miss)..1910
Dietel, Herman.....1920
DuBois, Gaston.....1921
Falk, John Charles, Ph.G., M.D..1900
Faber, Nathan Morris.....1922
Farr, Harry Valentine.....1920
Fricke, Frederick Henry.....1901
Fuhrmeister, Fred W.....1920
Gasen, Abraham Lincoln.....1921
Gietner, Charles, Ph.G.....1905
Grewe, Louis Frederick, Ph.G..1901
Hahn, Charles Wm. John Henry.1901
Hammett, Frank U.....1914
HEMM, FRANCIS.....1881

Hoenny, Adolph J.....1920
Ilhardt, William Kelerman.....1901
Koch, Albert H.....1914
Koeneke, Charles Henry.....1920
Koutsoumpas, William.....1922
Kring, Gustave.....1912
Kurtz, Irwin William.....1904
Lambert, Alert Bond.....1914
Lanwermeyer, Charles F.....1920
Lehmann, Louis John.....1911
Lieberstein, Jacob.....1913
Lieberstein, Louis, Ph.G.....1909
MALLINCKRODT, EDWARD.....1869
Margerum, Donald Cameron....1918
McCartney, Frank Leslie, Phar.D.1907
McGowan, William Chester.....1920
Merrell, George Robert.....1901
Merrell, Hubert Spencer, Jr., Ph.B., Ph.C.....1910
Meyer, Carl F. G.....1918
Meyer, Otto Paul.....1920
New, Philip.....1920
Pauley, Alfred Washington.....1914
PAULEY, FRANK CHARLES.....1879
Pearlstone, Alexander.....1922
Quade, William H.....1920
Roellchen, Harry.....1920
Ruf, Frank A.....1913
Schlichting, Arthur Floyd.....1913
Schlueter, Robert Ernst, Ph.G., M. D.....1904
Schoenthaler, John Paul.....1901
Seitz, Lorenz Aloysius.....1901
Sennewald, Emil August.....1900
Speckart, Otto Norbert.....1914
Sternfels, Urvan Ruiz.....1918
Stuart, Francis Joseph.....1913
Sultan, Frederick William.....1901
Suppan, Leo Richard August....1904
Swift, Fred H.....1920
UHLRICH, FERDINAND GOTTLIEB..1881
Vogler, Herman A.....1920
Waggoner, Athol L.....1921
Welsh, Joseph Bruner.....1910
WHELPLEY, HENRY MILTON, PH.G., M.D.....1887
Williams, N. Emery, Ph.G.....1912
Wolff, Edward-Henry.....1901
Wyllie, John Hardie.....1920

Sedalia.

Bard, William E.....1901
SMITH, OTIS WILMER.....1903

Springfield.

Trantham, Isham A.....1914

University City.

Noble, J. Merner.....1917

Webster Grove, St. Louis Co.

MUELLER, AMBROSE.....1894
Ruddiman, Edsel Alexander, Ph.C., Ph.D., M.D.....1895

Windsor, Henry Co.

Wesner, Henry Clay.....1901

MONTANA.

Anaconda.

Fuller, Clarence R.....1920

Boseman.

Kraker, John Lewis.....1912

Broadus.

Solt, Stephen A.....1921

Butte.

Harshfield, S. M.....1921
Montgomery, W. R.....1915
Moore, Cecil J.....1922

Deer Lodge.

Mueller, Franklin C.....1921

Ennis.

Folkestad, Charles W.....1921

Great Falls.

Lapeyre, Ben. E., Jr.....1916
Woehner, Frederick A.....1909

Helena.

Starz, Emil.....1916

Lewistown.

Seiden, John W.....1920

Livingston.

Calhoun, William Baron.....1921
Cowles, Donald Carson.....1922
Scheuber, Frank Augustus.....1905

Malta.

Murray, J. F.....1920

Miles City.

Foster, George K.....1920

Missoula.

Coffee, Sidney J.....1909
Mollett, Charles Edwin Francis, Ph.C.....1909
Peterson, A. Francis.....1922
Peterson, Alex F.....1914
Rakeman, Henry.....1922

Pablo.

Olson, Silas C.....1921

Volier.

Starbuck, James Nathan.....1920

Winnett.

Woods, Robert J.....1920

NEBRASKA.

Arlington.

Weber, Don Caesar.....1908

Atkinson.

Schultz, William Ludwig.....1915

Auburn.

Dort, Edward Harvey.....1903

Edgar.

Brookley, Will.....1915

Fairbury.

Pease, Autumn Vine.....1893

Holdredge.

Fink, Daniel Jacob.....1903

Kearney.

Hoye, Daniel J.....1911

Kenesaw.

Mikkelsen, Niels.....1903

Lexington.

Naviaux, Ernest Louis.....1918

Lincoln.

Burt, Joseph Bell.....1922
Butler, Guy.....1909
Danielson, Ryle Waldermar.....1921
Fruide, Glen O.....1921
Haschenburger, Edmund Ommen, Ph.G. 1907
Kunzmann, C. William.....1921
Lyman, Rufus Ashley, A.B., AM., M.D.....1908
Schneider, Albert, B.S., M.S., M.D., Ph.D.....1899
Wilson, Smith C.....1921

Long Pine.

Strelow, Geo. F.....1922

McCook.

McConnell, Lewis William, Ph.G.1904

Omaha.

Cermak, Emil.....1908
Fitz-Simon, Vincent Joseph.....1907
Gerald, Herbert Franklin, M.D..1908
GERING, HENRY R.....1906
Green, James Harvey.....1912
Myers, Preston B.....1921
Newton, Howard Chamberlain..1912
Sherman, Charles Rollin.....1889

Plattsmouth.

Fricke, Frederick George.....1903
Mauzy, James G.....1915

Stuart.

Coats, Mabel Leota.....1920

York.

Hildebrand, Charles Pinkney....1922

NEVADA.

Elko.

Englert, William Robert.....1915

Tonopah.

Piercy, Joseph C.....1918

NEW HAMPSHIRE.

Groveton.

Elliott, Fay Harold.....1916

Manchester.

Gilmore, Mildred Lillian.....1919
Knowlton, George Harry.....1907

Portsmouth.

Grace, William Day.....1896
Green, Benjamin.....1888
Norton, William M.....1920

Somersworth.

Des Marais, Napoleon Alphonse..1921

NEW JERSEY.

Atlantic City.

Crawford, Dean Burton.....1916
Schofield, Edith M.....1921
Venner, Frank A.....1921

Bayonne.

Bauer, Mabel Anna.....1922
Fentress, James H.....1920
Reiser, Philip.....1913
Turner, Joseph L.....1914

Bloomfield.

Goldberg, Abraham I.....1921

Bound Brook.

Cardarelli, Eugene James.....1916

Bridgeton.

Jorden, Henry Albert, Ph.G.....1902
Whipple, Oscar Kellog.....1916

Burlington.

Sparks, Edgar Reed, Ph.G.....1909
Sparks, Ruth Everest.....1921

Camden.

Beringer, George Mahlon.....1897
Beringer, George Mahlon, Jr., P.D. 1905
Carlander, Oswald Rudolph.....1921
Glebe, William Moss.....1920
Herting, A. C.....1918
Pitt, Charles.....1921

NEW JERSEY.

Randolph, John R.....1919
Reiss, Leon.....1920

Clifton.

Takamine, Jokichi.....1898

Collingswood.

Sturmer, Julius William, Ph.G., Phar.D. 1901
Vanderkleed, Charles Edwin....1902

Cranford.

Goeckel, Henry Jos.....1918
Zingales, Gaetano.....1920

Dover.

Meuser, Louis J.....1916

East Orange.

Dahl, Fred.....1913
Denny, Henry W.....1922
Ferguson, Robert H., M.D.....1922
Geisler, Leo Waldemar.....1910
Wickham, Edward A.....1919

Elizabeth.

Frohwein, Walter M.....1920
Jacobson, Samuel M.....1915
Langheinz, Louis P.....1915
OLIVER, WILLIAM MURRAY.....1875
Prebol, Bronislaw.....1920
Reibel, Charles A.....1922
Schmidt, Henry.....1904
Todd, Louren Evans.....1922
Zehner, Guy Oram.....1918

Frenchtown.

Harman, Harry M., M.D.....1909

Gibbstown.

Ullrich, Otto.....1920

Haddonfield.

King, James David.....1910

Hoboken.

Brisson, Alfred Frederic.....1916
Schmidt, Adolph.....1920

Irvington

Scholz, Frank H.....1921

Jersey City.

Florenzie, Oscar Howard.....1920
FOULKE, JAMES.....1881
Gold, Arthur.....1920
Hommell, Philemon E.....1922
Kohl, Abraham.....1921
Mahan, Christopher H.....1922
McCloskey, Charles J.....1919
Owens, William H.....1916
Patella, Carmela.....1918
Renzulli, Aurelio V.....1920
Richardson, Gerald Arthur.....1918
Uhorchak, Michael.....1920
Vena, John J.....1921

Kearney.

Shaak, Franklin Philip.....1906

Keyport.

Hopkins, Henry T.....1921
Warn, William Edgar.....1886

Lakewood.

Taylor, Leon A.....1916

Linden.

Kraemer, William Charles.....1914

Maplewood.

Geimer, Frederick M.....1916

Matawan.

Stevens, Oscar B.....1922

Maywood.

Balmert, Clemens A., Phar.D....1909

Medford.

THORN, HENRY PRICKETT, PH.G.1879

Middletown.

Spiers, Douglas R.....1921

Montclair.

Gesell, William H.....1919
Stein, Edward Theodore North.1916
Wrench, Henry Ernst, Jr., Ph.G.1902

Morristown.

CARRELL, EUGENE AYERS.....1875
Smith, Henry M.....1918

Mount Holly.

Jones, Edward B.....1909

Newark.

Bear, Pierce B.....1905
Crooks, Harry W.....1915
Disbrow, William Stephen, M.D.1915
Essbach, Gustave John.....1921
Foster, John Benjamin.....1901
Greenwood, Joseph Hermann....1920
Haase, William Frederick, Jr....1918
Holton, Charles William.....1907
Knecht, Paul F.....1920
Koeble, Carl Robert.....1919
Lebolt, Sidney J.....1922
Lewit, Harry A.....1922
Maltbie, Birdsey Lucius.....1912
Marquier, Adolph F., Ph.G.....1909
Menk, Charles William.....1898
Prach, Thomas W., Jr.....1922
Quin, Harry J.....1918
Rusby, Henry Hurd.....1890
Scholz, Oscar Robert Bruno....1909
Seidler, Alexander.....1916

Sherwin, Robert S.....1922
Staehle, Louis L.....1916
Tuffiash, Charles.....1920

New Brunswick.

Anderson, John.....1918
KILMER, FREDERICK BARNETT....1886

Orange.

Byrnes, Garrett.....1913
Grossman, Morris.....1921
SAYRE, EDWARD AUGUSTUS.....1877

Paterson.

Cohen, Gerschen.....1921
Dewis, William J.....1920
Jaffe, William M.....1920
Lamar, Wm. Robinson.....1901
Mutter, Wm.....1920
McLean, Walter Graham.....1920
McNeil, William Henry.....1912

Perth Amboy.

Hawryliw, Paul.....1920
Parisen, George Warren.....1892

Phillipsburg.

Gruver, Carl W.....1922

Plainfield.

Tocco, Orazie.....1910

Point Pleasant.

Johnson, Albert Burtis.....1916

Rahway.

Millman, Harold Fildew.....1920
Murray, Benjamin Linley, Ph.C., B.S., A.M.....1896
Verneau, Edward J.....1916

Ramsey.

Hubbard, Winfield Scott, Ph.G., B.S., M.A., Ph.D.....1912

Rutherford

Makholm, Jeppe C. M.....1920

Spring Lake Beach.

Hills, Daniel Henry.....1918
Johnson, Gustav Adolph.....1920

Summit.

Rothberg, Pincus.....1921

Tenafly.

Bower, Edwin Lawrence.....1909

Trenton.

Leigh, Francis B.....1921

Union Hill

Bischoff, H. E.....1915

Vineland.

Lowe, Clement Belton, Ph.B., Ph.G., M.D.....1895

Weehawken.

Frank, August, Ph.G.....1912

West Hoboken.

Eckert, Frank H.....1921
Maggio, James Innocenzo.....1907
Suhr, Louise Seline.....1916

Westfield.

Frutchey, George Watson.....1909

Westmont.

Rose, William Wilson.....1918

West New York.

Clarke, Hugh.....1921
Herman, Charles.....1919

West Orange.

Mead, Harold Barr.....1910

Woodstown.

Andrews, George M.....1913

NEW MEXICO.

Albuquerque.

Ruppe, Bernard Charles.....1908

Raton.

Weitgenant, Wayne W.....1921

NEW YORK.

Albany.

BRADT, WARREN LANSING.....1903
Lange, Wm. Maurice.....1914
MICHAELIS, GUSTAVUS, PH.G....1882
Ostrander, Clarence Edward....1916

Antwerp.

Rogers, George L.....1920

Auburn.

Adams, Arthur Ellison.....1902
Sears, Charles Barager.....1906

Babylon

Weinschenk, Harvey.....1922

Bronx.

Fennell, Emil.....1922
Frank, Henry.....1918
Petretti, Oreste.....1918
Stearns, William Lincoln, Ph.G.1903
Zagat, Mendel.....1918

Brooklyn.

Anderson, William Christine, Ph.G., Phar.D.....1900
Arnold, Henry C. F.....1918
Austin, Frederick James.....1920
Bartlett, Kenneth A.....1919

NEW YORK.

Berg, Frantz F., Ph.G.....1914
Bloom, Paul D.....1921
Brownelle, Howard F.....1920
Caruso, Joseph.....1922
Cook, Harry Warren.....1919
Creagan, William Thomas.....1912
Cupo, Phillip G.....1920
DeJonge, Cornelius.....1899
Dewender, William Henry.....1896
Diehl, August.....1909
Dissosway, Thurston N., Ph.C..1905
Dodge, Francis Despard.....1910
Dougherty, Albert James.....1921
Downer, William J.....1920
Duerr, George John.....1911
Eccles, Robert Gibson, M.D.....1885
Fischer, Charles F.....1919
FOUGERA, EDMUND CHARLES HENRY 1890
France, Thos. J.....1917
Freidman, Ephraim.....1922
Friedhoff, Ernest.....1920
Glassgold, Louis R.....1922
Guerra, Alirio Diaz, M.D.....1916
Heimerzheim, Eugene.....1914
Jones, Robert E.....1921
Kaminsky, Harry.....1920
Kitzis, Max.....1921
Krumwiede, Howard Andrew...1919
Levine, David.....1921
Lohness, Archie Percival.....1913
Mangan, Daniel C.....1918
Marinoff, Jacob.....1915
MCELHENIE, THOMAS DEARMOND, PH.G.....1872
Means, Earl A.....1918
Miller, Reginald.....1921
Neninger, Fred Martin.....1915
Nitardy, Ferdinand Wilhelm, Ph.G., Ph.C.....1905
Parisi, Dorothy.....1922
Planton, H. Rolff.....1916
Quillen, Joe Willard.....1920
Raubenheimer, Otto, Ph.G.....1902
Ritch, Allan L.....1920
Rosenzweig, Benjamin.....1898
Rottenberg, Morris L.....1922
Santi, Ruisi.....1920
Saperstein, Abraham.....1921
Schaefer, Frederick.....1916
Schoetzow, Ray E.....1920
Schwartz, Israel.....1914
Smith, Henry B.....1920
Smith, Henry Lees.....1920
Sundock, Philip.....1920
Tuthill, Frederick Percival, Ph.G., Phar.D.....1899
Weygandt, Wm. H.....1918
Wyckoff, Elmer Ellsworth.....1906

Buffalo.

Bentz, Henry George.....1904
Booth, Clarence Frederick.....1916
Dimond, Harry John.....1904
Dunghi, Mario Louis.....1921
Fish, Erwin L.....1918
Gregory, Willis George, M.D., Ph.G. 1886
Handy, John Abner.....1914
HAYES, HORACE PHILLIPS.....1880
Koch, Edward Wm.....1918
Lockie, Peter M.....1911
Morgan, Richard Franklin.....1914
Raymond, Russell E.....1922
Southard, Frank A., Ph.G.....1903
Starr, Mabel Charlotte.....1916

Cairo.

Austin, Richard A.....1916

Cambridge.

Richardson, Frank, Ph.G.....1906

Catskill.

Decker, Louis B.....1922
DUBOIS, WILLIAM LANEMAN....1880

Chatham.

Alvord, Harry E.....1919

City Island.

Gilbert, Otto Philipp.....1920

College Point.

Klein, Edward Nicholas Emil, Ph.C. 1905

Corning.

COLE, VICTOR LEROY.....1880

Corona, L. I.

Doctors, Alexander.....1921

Dannemora.

Sloss, Robert Audley.....1901

Delmar.

Mansfield, Wm.....1907

Edgemere, L. I.

Lowenstein, Leopold.....1922

Ellis Island.

Scott, Edgar Burroughs.....1905

Elmhurst, L. I.

Goodman, Joseph.....1916

Elmira.

Atwater, Herbert D.....1920

Far Rockaway, L. I.

Canis, Otto F. A.....1918

NEW YORK.

Flushing.

HEPBURN, JOHN.....1873

Garden City.

Klipp, John F.....1922

Hempstead.

Woell, John.....1922

Hudson.

Wardle, Arthur Stanley.....1910

Jamaica, L. I.

Kassner, Herbert Carl.....1921
Kitzer, William Joseph.....1922

Jamestown.

Anderson, Arthur E.....1921

Kingston.

Dedrick, William Frederick.....1914
McBride, Charles Luther.....1910

Larchmont.

Koehler, Albert.....1920

Little Falls.

Hurley, John.....1909

Little Valley.

Fuss, Chester George.....1922

Long Island.

Hearn, Joseph Cecil.....1921
Lane, Florence Carolyn.....1921
Luck, Julius Alexander W.....1910
MICHAELS, GEORGE L.....1917
Morgan, William F., Phar.D....1917
Noonan, Harry.....1916
Waring, Olaf I.....1921
Yeomans, Sidney C.....1920
Zeluff, Irwin Simpson.....1915

Lynbrook, L. I.

Dunn, Mrs. John A.....1919

Middletown.

Rogers, Fred Schwartz.....1914
ROGERS, WILLIAM HENRY.....1869

Mineola.

Kloving, Carl A. H.....1922

Mount Vernon.

Horstmann, Gustave, Ph.D.....1914
Swallow, Edward.....1922

New Lebanon.

Cox, J. Harry.....1914

New York.

Allison, William O.....1895
Altman, Jos.....1914
Aquaro, Joseph.....1920
ARNY, HARRY V., PH.G., PH.D..1891
Baden, Frederick, Jr.....1920
Ballard, Charles William, Ph.C., Phar.D., M.A.....1908
Baltzly, Elizabeth.....1920
Bankoff, Jacob.....1915
Beilstein, Christian.....1907
Berger, Louis, Ph.G.....1907
Bernstein, Chanon.....1916
Bigelow, Clarence Otis.....1900
Bilhuber, Ernst.....1912
Black, Franklin.....1916
Blomeier, Herman Henry.....1915
Blumenkranz, Isidore Jacob.....1916
Bonisteel, Wm. J.....1921
Brandt, Max.....1920
Breivogel, Philip J.....1916
Brickelmaier, Paul H.....1913
Brown, Lewis Nathan.....1916
Buch, Henry.....1920
Budelman, Fred J.....1920
Bush, Burton T.....1916
Caan, James H.....1920
Caleagno, Vit.....1920
Cantor, Charles I.....1920
Caracciolo, Egidio.....1920
Caruso, Therdue E.....1922
CHANDLER, CHARLES FREDERICK..1867
Chapman, Chas J.....1918
COBLENTZ, VIRGIL.....1882
Commons, Gordon L.....1921
Commons, Vivian K.....1921
Cone, Alfred I.....1905
Cooperman, Samuel.....1920
Costelo, David.....1915
Currens, Turner Fee.....1914
Daggett, Volvey Chapin.....1901
Dean, Corliss Page.....1917
Decker, George.....1920
Depuy, Jay Jacob.....1922
Diamond, Peter.....1920
Diekman, Clara Ada (Mrs.)....1912
Diekman, George Charles.....1898
Dill, Charles Thomas.....1917
Dillemuth, Frederick G., M.D...1916
Diner, Jacob, Ph.G.....1906
Dreyer, John D.....1917
Dusenberry, Elias W.....1920
Eddy, Clyde L.....1916
Eldred, Frank Randell.....1905
Erhart, William Hermann.....1907
FAIRCHILD, BENJAMIN THOMAS.1875
Fairchild, Samuel William.....1887
Fairchild, Tappen.....1920
Feldman, Jacob.....1917
Fischelis, Robert Philip, Ph.G., Ph. C., B.Sc.....1911
Fox, Sidney.....1922

NEW YORK.

FRASER, HORATIO NELSON, PH.G., PH.M., M.D.....1888
Friedgen, Charles.....1915
Galpin, Harry Tower.....1920
Gane, Eustace Harold.....1895
Geisley, Joseph Frank.....1889
Gerstner, Robert R.....1920
Gilbert, Alfred W.....1922
Glick, Harry.....1922
Golding, George Henry.....1920
Goldstein, Samuel A.....1922
Goldwag, Joseph Samuel.....1918
Greenberg, Meyer.....1920
Grossman, David.....1920
Gullo, Salvatre Joseph.....1920
Hamann, William Augustus.....1907
Hammer, Harry Julius.....1921
Hansburg, Max.....1916
Harris, Harry L.....1913
Hart, Fanchon.....1917
Hatcher, Robert Anthony.....1905
HAYNES, DAVID OLIPHANT.....1887
Haynes, Nathan William.....1920
Henning, Adolph.....1905
Herenberg, Curt.....1920
Herzog, Carl J.....1918
Hessler, Elmer H.....1914
Hoffman, George Niles.....1902
Hoffner, Daniel.....1922
Hohmann, George.....1910
Holliday, Francis Emlen.....1900
Hopkins, Jesse L.....1898
Hostmann, Jeannot.....1912
Ippolito, Frank Alfred.....1922
Israel, Boris S.....1918
Israel, David.....1918
Jacobsohn, Joseph.....1915
Jones, James H.....1915
Kaess, Israel.....1922
Kalish, Oscar G., Ph.G.....1900
Kantrowitz, Hugo.....1907
Keim, Raoul D.....1916
KENNEDY, EZRA JOSEPH.....1887
Kenney, Frederick.....1922
Ketcham, Sylvius.....1918
Kirk, Wm. Charles, Ph.G.....1886
Klar, Edward.....1922
Klingmann, Albert.....1910
Klingman, Otto.....1913
Koch, William Julius.....1907
Konnerth, Rudolph Alexander.....1921
Krack, John.....1920
Kramer, Bela.....1920
Lampa, Robert Raymond.....1892
Lascoff, Jacob Leon.....1903
Lascoff, Joseph D.....1920
Leger, Edmond Joseph.....1921
Lehman, Robert Seel.....1917
Leslie, Frederick Arthur.....1916
Leventhal, Reuben.....1921
Levy, Louis Spencer.....1911
Litvin, Augusta.....1916
Loud, Theodore Richard L.....1917
Lovis, Henry Christian.....1892
Luft, George W.....1913
Lund, Charles.....1920
Lurei, James.....1914
MacAdams, Harold.....1920
Mace, John Edward.....1916
Macsata, William J.....1921
Maer, Peter.....1920
Major, Alphonse.....1913
Margulis, Abraham.....1920
Mayer, Joseph L.....1905
Mazeloff, Aaron.....1921
MCINTYRE, EWEN, JR.....1903
McKesson, Donald, B.A.....1906
McKesson, George Clinton.....1888
MCKESSON, JOHN, JR.....1867
McQuade, Jerry.....1921
Metz, Herman A.....1910
Meyer, Samuel.....1921
Miskimon, Robert Roy.....1921
Molwitz, Ernest.....1922
Muller, Philip.....1922
Nevin, Thomas.....1912
Nicolai, Nathaniel.....1920
Oats, Charles A.....1917
Pace, Homer S.....1916
Parker, Frank.....1918
Parsons, Charles West.....1920
Partos, N. C.....1916
Pegg, George W.....1918
Penick, S. Barksdale.....1914
Peppmuller, Ernest A.....1920
Pfeiffer, Gustavus Adolphus.....1910
Pierson, Romaine.....1913
Plaut, Edward.....1916
Pobe, C. Emil.....1922
Podolsky, Reuben.....1915
Pontecorvo, Louis.....1922
Potts, Thomas Humphreys.....1906
Pursell, Robert C.....1916
Putt, Earl B.....1914
Quackenbush, Benjamin Franklin.....1886
Rabinowitz, Wm. Joseph.....1915
Reaske, Herman.....1920
Renwick, William.....1920
Riefflin, George T.....1909
Rippetoe, John Ross, P.D.....1907
Roediger, Louis Frank, Ph.G.....1909
Roediger, T. Frederick.....1921
Roller, Emil, Ph.G.....1916

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Romanoff, Isidor Louis.....1921
Roon, Leo.....1913
RUNYON, EDWARD WHEELOCK....1875
Russin, Uriel.....1920
Sahm, Louis Napoleon.....1905
Schaefer, Hugo.....1916
Schieffelin, William Jay, M.D...1892
Schmeier, Alexander.....1921
Schmidt, Frederic Kuhn.....1921
Schnell, Harry Julius.....1906
Schweinfurth, George Edward..1907
Scott, Harry.....1907
Sencindiver, Judson.....1918
Shattuck, H. B.....1918
Sheinfine, Louis.....1921
Shigon, Henry.....1921
Schnitter, Adolf, Ph.G.....1914
Silkes, Charles.....1918
Sparhawk, Charles V.....1916
Spring, George Alexander.....1907
Starr, Frank C.....1917
Stauffen, Ernst.....1916
Steinach, Edwin C.....1919
Sterling, Montaigu M.....1918
Stevenson, Ralph M.....1921
Taub, Harry.....1921
Taylor, William.....1922
Timmermann, Richard Hermann.1909
Tischelman, Nathan.....1921
Tompkins, George R.....1916
Tucker, Thomas H.....1912
Ungerer, Wm. Geo.....1918
Velsor, Joseph A.....1913
Villamena, Ermilinda M.....1920
Walter, Herman.....1916
Wassercheid, August A.....1916
Weicker, Herman G.....1920
Weicker, Theodore 1905
Weil, Joseph L.....1922
Weiss, Emil Otto.....1907
WICKHAM, WILLIAM HULL.....1870
Willer, Max.....1920
Wimmer, Curt Paul.....1907
Witt, Abram R.....1920
Wolfson, Joseph.....1922
Yarp, Kuth C. (Mrs.).....1918
Yates, Franklin B.....1916
Zink, Edward.....1916
Zwilling, Harry.....1920

Norwich.

Beach, DeMott Clark.....1915
Eaton, Melvin Carr.....1916
McNulty, William Peter.....1916
Snyder, John Paul.....1915
Windolph, J. Fred.....1913

Oyster Bay.

Shepherd, James Edgar.....1920

Plattsburg.

Senecal, Henry C.....1911

Port Washington.

Berning, Bernhard H.....1922

Richmond Hill, L. I

Milana, Benjamin L.....1921
Sher, Edward.....1911
Stephenson, John Joseph, Ph.G.1905

Portchester.

O'Hagan, Chas. F.....1921
Jones, Harold, W.....1913
Samson, Meyer.....1921
Smith, J. Hungerford.....1913

Rockville.

Sterling, Harry.....1922

Rosebank, Staten Island.

Wolfe, Jos. Albert.....1916

Rye.

Pipowsky, Isador.....1921

Salamanca.

Krieger, John Christian.....1908

Sangertiss.

Sticht, Gustave Alfred.....1916

Saranac Lake.

Backes, John Joseph.....1922

Saratoga Springs.

Cramer, Louis H.....1914
FISH, CHARLES FREDERICK.....1866

Sayville.

Thornhill, Sewell.....1909

Scarsdale.

O'Farrell, L. P.....1921

Syracuse.

DAWSON, EDWARD SEYMOUR, JR..1876
Muench, Albert August.....1914
SNOW, CHARLES WESLEY.....1876
Wright, Herbert G.....1922

Tottenville.

Lehman, Charles Norton.....1909

Tuckahoo.

Harris, Isaac F.....1920

Utica.

Paolantonio, John.....1918
Watson, William, Jr.....1902

Westbury, L. I.

Barley, S. Marvin.....1920

Whitehall.

Manville, Edward P.....1922

NEW YORK—NORTH CAROLINA—NORTH DAKOTA.

White Plains.

Davis, Mrs. May Agnes.....1917
Quarfordt, Jarkof Albin.....1922

Woodhaven, L. I.

Canis, Otto P. M.....1921
Degele, Carl S.....1921

Yonkers.

Klatz, Boruch 1918
Petsche, Franz Friedrich Bismarck Wilhelm.....1892
Schlesinger, Leopold Joseph....1912

NORTH CAROLINA.

Asheville.

Goode, John Alonzo.....1920

Bryson City.

Bennett, Kelly Edwin.....1913

Burlington.

Henderson, John Leland.....1920

Chapel Hill.

Beard, John G.....1918
Howell, Edward Vernon.....1900

Charlotte.

Ledbetter, Edmond De Berry....1921
Stowe, James Pinkney.....1914

China Grove.

Swaringen, DeWitt Clinton.....1905

Dunn.

Grantham, George Kenneth.....1920

Edenton.

Sutton, James Linwood.....1916

Fayetteville.

Horne, Warren Winslow, Ph. C.1902

Greensboro.

McDuffie, Roger A.....1921

Greenville.

Brown, Joseph Key.....1920

High Point.

Matton, Geo. A.....1916

Kinston.

Isler, William Arthur.....1921

Linden.

McArtan, Alexander Bell.....1920

Monroe.

Blair, Stephen Oscar.....1920

Morganton.

Greyer, Charles Peyton.....1912

Mount Airy.

Hollingsworth, Joseph.....1920

Pittsboro.

Pilkington, Geo. R.....1916

Raleigh.

Hicks, Henry T.....1916

Rocky Mount.

Briles, David Thomas.....1916
Rose, Ira Winfield, Ph.G.....1912

Tarboro.

ZOELLER, EDWARD VICTOR.....1878

Tyron.

Missildine, Ernest Ellwood, A.B.1910

Wilmington.

Gahn, Henry.....1902
HARDIN, JOHN HARWOOD.....1881

Winston-Salem.

Dailey, J. F.....1921
Welfare, Sam E.....1916

NORTH DAKOTA.

Belfield.

McAdams, Alvin E.....1902

Berthold.

Stevenson, John O.....1922

Beulah.

Hall, Daniel Windsor.....1921

Bisbee.

Bugge, Peter O.....1920

Bismark.

Lenhart, Amil P.....1920

Bowbells.

Donovan, Timothy M.....1922

Buffalo.

Macphail, John C.....1920

Casselton.

Strehlow, H. R.....1918

Devil's Lake.

Engebretson, Elmer.....1918

Dickinson.

Orchard, Welland John.....1920

Enderlin.

Shirley, H. G.....1922

Fairmount.

Mergens, Peter.....1918

Fargo.

Bentson, Bernard Leo.....1909

Cook, Roy Gould.....1918
Hallenberg, Oscar.....1916
Ihlson, Phil R.....1920
Porterfield, Wm. Perry, Ph.G...1909
Puhl, Richard H.....1920
Sigurdson, Arinbjoin S.....1922
Sister Conchessa 1922
Sudro, William F.....1918

Garrison.

Roehm, William Arthur.....1920

Golden Valley.

Halbeisen, Joseph George.....1922

Grafton.

Hatlelid, Ras O.....1922
Haussamen, Henry Louis, Ph.G.1906

Grand Forks.

Vold, John N.....1916

Helron.

Itrich, Waldemar H.....1922

Hettinger.

Harris, Thomas Spencer.....1920

Jamestown.

White, Herbert E.....1920

Kathryn.

Anderson, Knute.....1922

Kenmare.

Zuercher, Oscar.....1920

Lakota.

St. John, Sidney I.....1922

Larimore.

Williams, Thomas R.....1920

Lisbon.

Parker Wm. S.....1918

Mandan.

Homan, Frank P.....1921
Shaffer, Frank L.....1920

Marion.

Hill, Homer L.....1918

McVille.

Brakke, Nols N.....1918

Milnor.

Hoel, S. C.....1920

Northwood.

Bilden, Paul.....1920

Oakes.

Simmons, Ingvold.....1922

Oberon.

Oliver, M. H.....1922

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Foss, Palmer L.....1919

Pembina.

Stinson, Ray C.....1922

Portal.

Reite, Andrew Martin.....1920

Sheldon.

Shelver, Wm. J.....1922

Stanley.

Eckstrom, Wm.....1922

Sutton.

Gunderson, Alfred J.....1922

Sykeston.

Wumkes, Peter E.....1922

Tower City.

Thompson, Carl McDonald.....1920

Wahpeton.

Keen, John J.....1920

Westhope.

Findlay, Thomas A.....1920

Wimbledon.

Lockett, George.....1920

OHIO.

Ada.

Raabe, Rudolph Henry.....1922

Akron.

Collins, Mrs. F. A.....1915
Davis, Ernest C., Ph. C.....1913
Norris, Dumont 1922

Avondale.

Merrell, Charles George, S.B....1888

Barnesville.

Ely, Ernest Sykes.....1904

Bluffton.

Hauenstein, Armin Hermann...1918
Hauenstein, Sidney.....1913

Brookville.

Smith, Harry B.....1920

Bucyrus.

Farquhar, William.....1916

Canton.

Antony, Charles W.....1915
Neuman, Fred Wilbur.....1922
Sister M. Mechtildes.....1922

Cincinnati.

Apmeyer, Charles Ascau.....1906
Austin, Edgar Covel.....1921

OHIO.

Barkdell, Clifford C.....1920
Betz, Otto E.....1916
Blumenthal, Isadore F.....1914
Bolte, Frank.....1916
Cain, Frank B., M.D.....1914
De Lang, Alfred.....1915
Fennell, Charles Theo. P., Ph.G., Phar.D. 1886
Foertmeyer, Chas. Geo., Dr.....1918
Freericks, Frank Herman, Ph.G., LL.B. 1905
Freiberg, Ralph.....1918
Grant, Ernest H.....1920
GREYER, JULIUS.....1880
Grothe, Frank Louis.....1922
Heinemann, Edwin.....1913
Heister, Louis.....1914
Helmsderfer, John C.....1919
Johnson, Scott Wilber.....1920
Katz, Otto 1922
Kisker, F. W.....1920
Kohl, John Henry.....1920
Lakamp, William.....1913
Lloyd, John Thomas.....1920
LLOYD, JOHN URI.....1870
Mayo, Caswell Armstrong, Ph.M., Phar.D. 1893
Miller, Chas. 1922
Mossmyer, Mrs. P. A.....1922
Murphy, Dennis E.....1914
Ott, Bertha (Miss).....1913
Schulz, Robert A.....1916
Silber, Ferdinand P.....1922
Thiesing, Edward Henry.....1912
Voss, Edward, Jr.....1904
Waltermann, Henry B.....1918
Weeke, Paul Herman Frederick.1922
Werner, Louis.....1913
Wetterstroem, Caroline (Mrs.)..1914
Wiltsee, Lee.....1920
Wittkamp, Clarence T.....1915
Zuenkeler, John Ferdinand, Ph.G.1887

Cleveland.

Albl, Oswald E.....1922
Albrecht, Joseph.....1920
Bauer, John M.....1920
Baum, Maurice Albert.....1920
Belohoubek, George.....1922
Benfield, Herbert E.....1920
Benfield, W. E.....1920
Bollinger, Clifford H.....1912
Brody, Noah J.....1922
Buckstein, Jacob.....1920
Cameron, R. C.....1922
Catalano, Fabian Joseph.....1920
Cermak, Frederick Jefferson....1916
Conrad, Alton F.....1920
Curtis, Morris E.....1915
Davidson, Aaron.....1922
Davy, Edward.....1917
Deubel, Frank Frederick.....1922
Ebnet, Otto.....1922
Ejbl, Anthony Bert.....1920
Elkind, James George.....1922
Filsinger, Aurel Howard.....1921
Flandermeyer, August Louis, Ph.G. 1910
Ford, William H.....1922
Fox, Willard Milton.....1903
Gerson, Morris M.....1922
Gleason, David J.....1916
Guenther, Harry F. J.....1915
Gusman, M.....1920
Hagemeister, Walter F.....1918
Hankey, William Tabor.....1902
Hayes, Ralph E.....1921
Hechler, Edward Henry.....1904
Helbig, Frank J.....1920
Hensge, William.....1915
HOPP, LEWIS CHRISTOPHER.....1876
Horsch, Wm. H.....1922
Jaffa, Philip Walter.....1921
Kobylanski, Zygmunt W.....1920
Lechner, Arthur Cyril.....1921
Lehr, Frank P.....1915
Loesch, Ellsworth.....1920
Lustig, Jacob.....1922
Mackay, Paul Joseph.....1921
Margolis, Nathaniel H.....1922
Matousek, Joseph L.....1922
Maurer, Albert J.....1920
Miller, Louis P.....1922
Morrison, Frederick Raymond..1921
Muhlhan, Otto Emil.....1905
Nesi, Albert.....1916
Nevel, Fred A.....1922
Pence, August Fred.....1916
Petersilge, Emil Carl.....1922
Placak, Harry, Ph.G.....1902
Pollock, Henry 1916
Pope, Alva J.....1919
Rabenstein, Edward, Jr.....1915
Rauchfleisch, Edward C.....1915
Reed, James Garfield.....1909
Rigelhaupt, Adolph.....1920
Rogoff, Elias M.....1921
Rothmon, Harold W.....1922
Selzer, Eugene Reinhold, Ph.C..1893
Sherwood, Henry Jackson.....1894
Sister Mary Alma.....1922
Sister Mary Rose.....1922
Sollmann, Torald.....1908
Sords, Thomas Vincent.....1893
Spease, Edward, B.Sc., Ph.C....1912

Spenzer, Mary H.....1916
Stanford, Ernest E.....1920
Stockhaus, F. William.....1915
Terry, Robert Wood.....1916
Varga, Louis Nicholas.....1915
Walleck, Andrew E.....1912
Winter, Carl.....1922
Zickes, Elmer Joseph.....1916
Zielinski, Max A.....1918
Zverina, Justin George.....1922

Columbus.

Ackerman, Philip Jacob.....1906
Bagley, Anna Gertrude.....1912
Braun, Carl L.....1915
Brown, Clarence M.....1921
Dye, Clair Albert.....1901
Ford, Myron Nile.....1912
Herpich, John Le Dure.....1906
Marckworth, Otto Stanley.....1913
SCHUELLER, FREDERICK WILLIAM.1880
Topping, George Ballard, Ph.C..1913
Webb, Edward Nathan.....1905
Wendt, William Carl.....1901
Wetterstroem, Theodore David..1897

Dayton.

Gallaher, J. Frank.....1921
Jenkins, Elizabeth (Miss).....1913
Moosbrugger, Charles Otto.....1920
Schmidt, Carl A.....1922

East Liverpool.

Flick, Theodore C.....1922
Guskea, Andrew E.....1922
Halloway, Jesse Daniel, Ph.C...1905
Johannes, Mrs. Ocy Crawford...1922

Germantown.

Boehme, Lawrence Karl.....1921

Glendale.

Igler, Herman E.....1918

Hamilton

Ribar, Louis A.....1922

Hillsboro

Garrett, Mrs. Elizabeth Y.....1922

Huron.

Morse, Harry Gilman.....1922

Kenmore.

Metzgar, Albert Paul.....1922

Lakewood.

Grosse, G. Wallace.....1919
Schoenhut, Christian Henry.....1888
Zettelmeyer, Herbert.....1920

Lisbon.

Hasbrouck, Donald West.....1922

Lorain.

Demeter, Stephen L.....1922
Hire, Harry C.....1922

Marietta.

Dysle, John William.....1920

Marion.

Osmun, Ralph Harper.....1921

North Canton.

Schafer, Charles Henry.....1921

Salem

Kaminsky, Charles Wm.....1922

Sidney.

Christian, Forest D.....1916

Springfield.

SIEGENTHALER, HARVEY NEWTON.1882

Steubenville

Wilson, George Henry.....1922

Struthers

Longnecker, John E.....1922

Toledo.

Bonnister, William Southwell...1922
Bowman, Waldo Moffet.....1905
Loesser, Paul A.....1915
Ludwig, William Edward.....1904
Rupp, Walding G., Dr.....1918

Warren.

Leach, Raymond A.....1921

Wyoming.

Sanders, Harry Benjamin.....1916

Xenia.

Donges, Wm. H.....1914

Youngstown.

Cassaday, Orlin Ulysses.....1899
Sister Marie Hortense.....1922

Zanesville

Bailey, F. P.....1922

OKLAHOMA.

Anadarko.

Nichols, Clarence Van Buren...1915

Haworth.

Woodson, George David.....1920

Hennessey.

Dinkler, Frank Adam.....1900

Muskogee.

Gotcher, Carl.....1922

Norman.

Baber, Charles.....1922

De Barr, Edwin.....1905
Hood, Frederick Redding.....1922
Johnson, David B. Ray.....1921
Mosher, Donovan D.....1918
Shoemaker, Harold Adam.....1921
Williams, Guy Randall.....1921

Oklahoma City.

Jarrett, Walter R.....1916
White, Louis Mortimore.....1921

Okmulgee.

Wallace, Arthur G.....1920

Shawnee.

Ashabranner, Dudley.....1921

Stilwell.

Shaw, Dwight Beach.....1921

Weatherford.

Hudelson, F. H.....1914

OREGON.

Coquille.

Fuhrman, Cyrus Jacob.....1915

Corvallis.

McWilliams, Hershel Brian.....1918
Strand, John Arnold.....1921
Ziefle, Adolph.....1910

Dufur.

Morton, Richard D.....1920

Merrill.

Robinson, Frank Bruce.....1922

Pendleton.

Daley, Charles William.....1920

Portland.

Betzel, I. L.....1916
Byerley, Fabian.....1909
Clarke, Louis Gaylord.....1909
Haack, Ludolph George.....1909
Kiesel, J. G.....1920
Nau, Frank.....1918
Perusse, Francis Joseph.....1915
Plummer, R. M.....1919

Salem.

Fry, Daniel Joshua.....1917

The Dalles.

Blakeley, George Clarence.....1892

Tillamook.

Clough, Charles Isaac.....1915

PENNSYLVANIA.

Altoona.

Ray, Talmage Turner.....1922

Ambler.

Mattison, Richard V., M.D.....1913

Ambridge.

Phelan, Wm. J.....1921

Ashland.

Schoenenberger, August.....1919

Beaverdale

Crawford, Harry R.....1922

Bethlehem.

Snyder, Harold Berlin.....1918

Birdsboro.

Weidner, Elmer M.....1921

Bloomsburg.

Moyer, W. V.....1920

Braddock.

Kutscher, George William.....1905
Rock, John.....1922

Bridgeport.

Law, Harold Noble.....1921

California.

Wagner, Garrett Edward.....1920

Camp Hill.

Wible, Hollis M.....1920

Carlisle.

HORN, WILBUR FISK.....1876

Carrick.

Kuenzig, Peter A.....1913

Castle Shannon.

Doyle, Joseph Jesse.....1909

Chambersburg.

Wagaman, Emmett E.....1922

Chester.

Hendrickson, Raymond.....1916

Clearfield.

Ashcraft, Bernard Alfred.....1921
Bloom, Cecil Read.....1917

Clifton Heights.

Duvoisin, Agnes (Miss).....1916

Coaldale.

McElroy, David Gregory.....1921

Coalport.

Eckbert, Charles Ryan.....1917

Columbia.

Zeamer, Harry Wisler.....1905

Connellsville.

Keagy, Elwood Milton.....1918

PENNSYLVANIA.

Coopersburg.

Koch, Howard Jonathan.....1916

Cynwyd.

Campbell, S. Ross.....1916

Dallastown.

Hartman, Jennings B.....1920

Duncansville.

Robertson, John H.....1918

East Dowington.

Worrall, Wesley.....1919

Easton.

Anspach, Paul Bucher, Ph.G....1903
Schlabach, Cyrus L.....1914
Werkheiser, Harold Edwin.....1920

Erie.

Russell, Thomas J.....1920

Farrell.

Greenstone, Charles A.....1916

Forty-Fort.

Heller, Theodore Rinehart.....1917

Gallitzin.

Reed, John Edwin.....1918

Germantown.

Hendrixson, Dale Zainer.....1922
Jenkins, William H.....1920
Sarlo, Joseph.....1918

Greencastle.

Carl, Charles Blair.....1910

Grove City.

De France, George W.....1910

Hanover.

Britcher, Frank Neal.....1921

Harrisburg.

Goodyear, Wilbur B.....1915
GORGAS, GEORGE ALBERT.....1884
Huber, Donald Witherow.....1918
Knouse, John A.....1920
Kramer, Charles F.....1910
Senseman, W. Thomas., Jr.....1920
Smith, Benjamin Franklin.....1892
Steever, William Forsaith.....1920

Hatboro.

Rothwell, Walter.....1907

Highland Park.

Roberts, Everett J.....1922

Hyndman.

Rhodes, Charles Reynolds.....1918

Irwin.

Kuhn, Ralph Alfred.....1921

Juanita.

Haberstroh, Ambrose Rea.....1921

Kingston.

Dinstel, Howard A.....1922
Lohmann, John.....1904
Mazanowski, Edw. C.....1919

Kittanning.

Sturgeon, Walter J.....1914

Lancaster.

Frailey, William Otterbein.....1903
Knight, Harry M.....1920
McAllister, Lory Curley.....1920

Lebanon.

LEMBERGER, JOSEPH LYON, PH.G., PH.M. 1858
Schaak, Milton Franklin.....1906

Lehighton.

Moyer, Lloyd R.....1921
Wagner, Clarence K.....1921

Lewistown.

Zook, Carl E.....1920

Luzerne.

Haight, A. C.....1918

Llanerch.

Morse, Horace B.....1921

Lock Haven.

Staub,. Brown Charles.....1921

Manheim, Lancaster Co.

Ruhl, Harry Frey.....1902

McKeesport.

Manns, Walter E.....1922
Schmidt, Adolph.....1916

McKees Rocks.

Sandles, Van Amburg.....1909

Meadville.

Utech, P. Henry, Ph.G.....1907

Media.

Roberts, John Griffith.....1914

Minersville.

Kiltsch, Charles J.....1919

Mt. Carmel.

Pachuta, Michael.....1919

Nazareth.

Heckman, Paul Willard.....1921

New Castle.

Wallace, Mrs. Emma K.....1922
Wallace, John Crawford, Phar.D. 1905

PENNSYLVANIA.

New Cumberland.

Good, Jacob Edison.....1916

Newport.

Bosserman, Charles Emmett....1918

Norwood, Delaware Co.

Borneman, John A.....1922

Ogontz.

Clayton, Azram Theophilus.....1906

Oil City.

Dockery, Raymond Edward.....1922

Parkersburg.

Hawk, Asher Miller.....1920

Parsons.

Filar, Louis L.....1919

Philadelphia.

Aidenbaum, Philip Lincoln.....1919
Austin, Frank J.....1922
Baer, Jacob Michael.....1902
Barol, Alfred.....1922
Bernstein, Mitchell.....1918
Blackwood, Russell Thorn.....1907
Blaustein, Louis Nathan.....1921
Bongiovanni, Joseph Nathaniel..1916
Brinton, Clement Starr.....1906
Busch, Henry Paul.....1910
Busch, Miers.....1903
Cadmus, Robert Clark.....1906
Cahan, Samuel.....1915
Campbell, Milton.....1902
Campbell, Theodore.....1902
Cliffe, William Lincoln.....1898
Cohen, Benjamin H.....1922
Coleman, David.....1920
Cook, E. Fullerton, P.D.....1901
Dean, J. Atlee.....1914
Decker, Robert William.....1907
Derrico, Anthony.....1921
Dorfman, Rudolph K.....1918
EBERLE, EUGENE GUSTAVUS, PH.M. 1896
Eberly, Earl.....1919
Ehman, Joseph W.....1918
Ehmann, Karl Francis.....1916
Elliott, Charles S.....1914
ENGLAND, JOSEPH WINTERS.....1893
Eppley, Joseph A.....1919
Ewe, George Elwood.....1919
Evans, George Bryan.....1902
Ferguson, James A.....1913
Fisher, Henry, M.D.....1916
Foran, Ralph Richard.....1919
Fox, Sereck Hall.....1921
Frank, Charles I.....1922
French, Harry Banks.....1890
Friedman, William Leonard.....1918
Furman, Frank H.....1921
Gallagher, Pierce James.....1921
Galloway, Clarence Moore.....1920
Gano, William Hubbell, Ph.G...1892
Gershenfeld, Louis.....1915
Githens, Thomas Stotesbury....1909
Glantz, Morris.....1921
Glass, Raphael.....1919
Glaymen, Edward Eben.....1922
Goldenberg, Joseph G.....1922
Goodhart, Brua Clifford.....1918
Graham, Willard.....1902
Griffith, Ivor.....1916
Gross, David Coleman.....1922
Gutzeit, Charles Samuel.....1921
Hahn, Edward T.....1918
Hall, Wm. Daniel.....1915
Harbold, Curtis Alexander.....1907
Harrisson, Joseph Whipple Eugene 1918
Harvey, Gilbert.....1920
Haussman, Frederick William..1895
Hertzler, Gains B.....1920
Hires, Charles E.....1916
Hoch, Quintus.....1907
Hunsberger, Ambrose 1905
Jones, Amos 1915
Kahn, Solomon Karl.....1905
Kauffman, Irwin Harry.....1921
Kendig, H. Dvert.....1916
Kercher, Edwin Harry, Ph.G....1907
Kirby, Charles P.....1909
Kline, Clarence Mahlon, Ph.B...1902
Klopp, Henry L.....1913
Koch, Charles N.....1921
Kwaitkowski, Adam J.....1920
Lackey, Richard Henry.....1907
Lantz, William Henry.....1908
LaWall, Charles Herbert, Ph.M.1896
LaWall, Millicent Renshaw (Mrs.), P.D.....1905
Lerner, Albert.....1921
Lieber, Maurice L.....1920
Maguire, Raymond Francis.....1920
Mallard, Oscar Paul.....1916
Matusow, Harry, Ph.G.....1897
McNeary, Wm. Wilson.....1915
McNeil, Robert.....1907
Mellor, Alfred.....1864
MILLER, ADOLPHUS WILLIAM, PH.G., M.A., PH.D.....1868
Minehart, John Roy.....1905
Moerk, Frank Xavier, Ph.G, Ph.M. 1898
Molloy, John J.....1920
Morgan, Frank E., Ph.G., Phar.D. 1906

PENNSYLVANIA.

MORRIS, LEMUEL L.....1880
Mulford, Henry Kendall.....1896
Nebig, William George, Ph.G...1907
Neff, Harry.....1921
Nichols, Adley Bonisteel.....1918
Noble, Joseph W.....1920
Novack, Harry J., M.D.....1916
Noveck, Morris.....1921
Osterlund, Otto William.....1902
Pachali, Theodore, Jr.....1907
Peacock, Bertha Leon (Mrs). Ph.G. 1895
Peacock, Josiah Comegys, Ph.G.1892
Pearson, William Alexander....1908
Penn, Leo G.....1920
Pittenger, Paul Stewart, Ph.G., Ph.C., Phar.D.....1911
POLEY, WARREN HENRY.....1906
Rabinowitz, Abraham.....1918
Rapoport, Julius G.....1918
Raymond, Henry S.....1920
Reese, David J.....1915
Rehfuss, Charles.....1908
Reif, Ernest.....1915
Robinson, Joseph.....1922
Rosengarten, Adolph G.....1913
Rosengarten, Frederick.....1913
Rosengarten, George David.....1902
Rosengarten, J. G.....1913
Rosin, Joseph.....1914
Roth, Herbert Joseph.....1921
Schacterle, George Kyle.....1922
Seidman, Harry.....1911
Seltzer, Joseph Pincus.....1919
Seraballs, Enrique Aulet.....1920
Seigfried, Howard J.....1907
Simpson, Robert.....1913
Slatter, Charles F.....1921
Smith, Howard E.....1910
Smith, Mortimer Mann.....1921
Smith, Walter Valentine.....1902
Staudt, Albert John.....1907
Stein, Milton.....1918
STEWART, FRANCIS EDWARD.....1884
Streeper, Frank Park.....1907
Stroup, Freeman Preston, Ph.M.1900
Sutom, Ko.....1921
Thum, John Karl, Ph.G.....1905
Townsley, George Tripp.....1920
Trachtenberg, Doris.....1922
Vogel, Mary Lynch (Mrs.).....1920
Wallace, George R.....1914
Wear, John.....1918
WEIDMANN, CHARLES ALEXANDER, PH.G., M.D.....1868
Weidman, I. S.....1919
Weisner, Nicholas Frederick....1909
White, Robert C.....1918
Whitehill, John.....1920
Wood, Horatio C., Jr., M.D....1906
Whyte, Hilson H.....1920
Wierczbicki, Stephen.....1919
Worthington, John Warren Wolfe 1912
Wyman, Abraham.....1921
Youngken, Heber Wilkinson, A.B., A.M., Ph.G.....1912

Pittsburgh.

Bluestone, Isadore.....1916
Blumenschein, Frederick John...1904
Burkett, K. S.....1915
Burrier, Anna Zoe.....1922
Busis, David.....1920
Darbaker, Leasure Kline, Ph.G., Phar.D. 1909
EMANUEL, LOUIS.....1878
Gilleland, John Roy.....1914
Hodge, M. Margaretta.....1922
Hofmeister, Ralph Richard.....1920
Horvitz, Max.....1922
Janda, Thomas John Joseph.....1913
Judd, Albert Floyd.....1901
KOCH JULIUS A.....1892
Kossler, Herman Stanislaus.....1905
Kretz, Edward John.....1909
Lohmeyer, Henry L.....1910
McNulty, James C.....1909
Meyers, Alexander.....1920
Mierzwa, Richard.....1908
Miller, Charles Jacob.....1922
Miller, Joseph J.....1918
Nied, Mrs. Helen Edna.....1921
O'Brien, Robert Stephen.....1921
Prichard, Benjamin Elliott.....1908
Reif, Dr. Edward Clarence.....1921
Rodemoyer, William Edward...1901
Saalbach, Carl, Ph.G.....1908
Saalbach, Louis, Ph.G., Phar.D..1907
Schaefer, Charles Henry, Ph.G..1909
Schaefer, Emil August, Phar.D.1900
Sister M. Casilda Ruewe.....1922
Snyder, Goldie Esther.....1921
Truby, Miriam Grace (Miss)...1914
Walter, Peter Grant, Ph.G., Phar.D. 1905
Weimer, Roth Eardon.....1918
Weissmiller, Paul V.....1920
Wignall, William G.....1922
Wurdack, John Herman.....1909
Zeman, Isador Louis.....1920

Pittston.

Kane, James F.....1919

Plymouth.

Groblewski, Alphonse Paul.....1921
Groblewski, G.....1919
Harris, R. A.....1919

Pottsville.

DEIBERT, THOMAS IRWIN.....1882

Reading.

Ziegler, Howard Philip.....1905

Renovo.

Carstater, James C.....1920
Case, Ray Harris.....1922
Slack, George Curtiss.....1922

Ridgway

Ross, Paul Hanson.....1921

Rochester.

Hamilton, Mary R.....1922

Scranton.

Brown, Andrew.....1915
Gardier, Louis.....1919
Knoepfel, William Henry.....1909

Shamokin.

Lehr, Irwin E.....1921
Reidinger, Laurence Ernest.....1921

Spring Grove.

Myers, William Bryan.....1920

Susquehanna.

Reddon, Frank J.....1920

Towanda.

PORTER, HENRY CARROLL.....1872

Tremont.

Schultz, Anna.....1918

Uniontown.

Zacovic, Andrew.....1918

Washington.

Vowell, Louis Sweitzer.....1905

W. Pittston.

Evans, Samuel Morgan.....1918

Wilkes-Barre.

Aston, E. Arthur.....1916
Bennett, Henry.....1920
Cohen, Harry A.....1921
Goulden, Frank.....1920
Greenstein, Norris.....1918
Meyer, J. Gross.....1920
Shovlin, John J.....1919

Wilkinsburg.

Baier, Albert E.....1918

Williamsport.

Walton, Lucius Leedom, Ph.G., Phar.M., Phar.D.....1904

York.

Leber, Jacob Gilbert.....1905
Shearer, George Keyworth.....1917

PHILIPPINE ISLANDS.

Batangas.

Orosa, Maria Ylagan.....1920

Manila.

Castillo, Eduardo A.....1920
Imson, Juan Rosales 1916
Jaehrling, Valerio C.....1922
Jason, Primitivo.....1922

PORTO RICO.

Ceiba.

Saavedra, Salinas Miguel.....1918

Fajardo.

Veve, Miguel A.....1918

Georgetti, Humacao.

Moscoso, Gustavo.....1922

Mayaguez.

Mulet, Luis.....1918

San-Sebastian.

Cabrero, Narcisco Rabell.....1915

RHODE ISLAND.

East Greenwich.

Earnshaw, Arthur Morris.....1921

Howard.

Boren, Walter Theodore.....1922

Narragansett Pier.

Davis, Peter Bernard.....1909

Newport.

Benton, William Mayze.....1919
Bigelow, Allen Franklin.....1920
French, Leon Hermann.....1917

Pawtucket.

Morgan, George Smith.....1909
Phillips, Wendell E.....1918
Tyler, Earl Albert.....1916

Providence.

Anthony, Edwin Perkins.....1909
Claflin, Albert Whitman.....1913
Corrigan, Michael Henry.....1913
Haynes, Herbert.....1908
Mason, E. H.....1920
Pearce, Howard Anthony.....1894
Reiner, Nicholas F.....1913
Sister Mary Tryphonia.....1922

SOUTH CAROLINA.

Bamberg.

McCrackin, Furman Butler.....1919

Bennettsville.

Matthews, Odell Atwood.....1920

Charleston.

Aimar, Arthur P.....1920
Harper, William George.....1920
Hyde, Joseph Bell, Jr., Ph.G....1909
Zeigler, Washington Hayne.....1915

Columbia.

Otis, Robert Kinlock.....1921

Elloree.

Dantzler, Marion S.....1920

Florence.

Darby, William Henry, Jr.....1921
Riley, David Tilden.....1920
Smith, James Fillmore.....1921
Walsh, Edward Porchet.....1921

Greenwood.

Coleman, Arno A.....1916
Hodges, Samuel Connor.....1920

Greenville.

Bates, John 1920
Bruce, Joseph B.....1920

Jonesville.

Ellerbe, Frank M.....1921

Pickens.

Yongue, James Douglas.....1918

Spartansburg.

Rigby, Isaac Alonzo.....1920

Whitmere.

Duckett, Robert Maxwell.....1920

SOUTH DAKOTA.

Artesian.

Howell, Henry Saxton.....1922

Big Stone City.

Clute, Perry H.....1920

Brookings.

Hogstad, Anton, Jr.....1918
Riley, Miss Edna.....1921
Serles, Earl R.....1920

Castlewood.

Amundson, Adolph M.....1922

Canton.

Dexter, David L.....1922

Centerville.

Heisler, John Emery.....1910

Clear Lake.

Engebretson, Engelbert A.....1922

Cresbard.

Bittner, Albert O.....1921

Dell Rapids.

Bent, Edward Clarence.....1915

Eden.

Landsberger, Theodore D.....1920

Estelline.

Hoffelt, Edward.....1910

Garretson.

Johnson, Ole.....1922

Gary.

Fouger, James H.....1922

Herreid.

Blair, John H.....1922

Herrick.

Bryant, Francis Asbury.....1920

Hot Springs.

Brown, Floyd Woodford.....1910
Highley, L. E.....1913

Kindred.

Strehlow, Max Henry.....1922

Mellette.

Ross, John J.....1922

Mitchell.

Scallin, Stephen Harmon.....1910

Pierre.

Schubert, Max J.....1922
Vilas, Fred L.....1918

Redfield.

Pool, James Arthur.....1918
Robbins, Norma.....1922
Warne, Cyrus B.....1922

Reliance.

Williams, Geo.....1922

Vienna.

Eng, Julius C.....1922

Wanbay

Thul, M. A.....1922

Watertown.

Jones, David Franklin.....1895
Jones, Victor E.....1922
Zieske, Arthur, Ph.G.....1910

White Rock.

Rott, John Alfred.....1922

Winchester.

Prince, Clofton O.....1914

Woonsocket.

Freese, Arthur C.....1921

TENNESSEE.

Chattanooga.

Maines, Eugene L.....1912
Voight, Joseph Frederick.....1893

Clarksville.

Coulter, George W.....1917

Henning.

Turner, Thomas David.....1918

Johnson City.

Whitehouse, Harry.....1917

Knoxville.

Rosenthal, David Abraham, Ph.G. 1894

Memphis.

Cox, Wiley Jones.....1920
Crowe, Robert Latta.....1914
ROBINSON, JAMES SCOTT.....1869
Sheely, Edward Valentine.....1918

Morristown.

Clark, Walter Gay.....1922

Nashville.

Clark, Ira Benton.....1900
Hubbard, George Whipple.....1913
Kremers, Roland Edward.....1920
Mullowney, John J.....1922
Pully, Luther Smith.....1910
Smith, Frank Leslie.....1910
Weise, Carl E.....1914
White, William Rufus, Ph.C....1904

Newburn.

Westbrook, Charles Gray.....1912

Sharon.

Shannon, Thomas J.....1905

TEXAS.

Amarillo.

Collins, Josiah Wm.....1922

Batson.

Teel, William Polk.....1920

Bay City.

Huston, Peacher Grattan.....1920

Brownsville.

Willman, William George.....1904

Brownwood.

Hallum, Charles M.....1920

Childress.

Roberson, Tom J.....1921

Cleveland.

McMahon, J. D.....1920

College Station.

Blackberg, Solon Nathanel.....1920

Crockett.

Bishop, William Penn.....1914

Cuero.

Duggan, John Marion.....1920

Dallas.

Coulson, James Thomas.....1906
De Lorenzi, Albert.....1890
Duncan, C. A.....1921
Fletcher, Joel Morgan.....1915
Long, Eugene Hughes.....1919
Mitchell, Lloyd Benjamin.....1912

Dilley.

Breininger, M. H.....1916

El Paso.

Dorsey, Maurice Edward.....1916
Sister Marie Collens.....1922

Encinal.

Guerrero, Juan Cantu.....1911

Farmersville.

Rike, Zeb W.....1916

Flatonia.

Mikulik, Ed. M.....1920

Forney.

Adams, Walter Dickson.....1913

Galveston.

Buckner, John Clark.....1905
Sister Mary Kieran.....1922
Koester, Hermann.....1910
Wilder, Gaston H.....1916

Giddings.

Hielscher, H. E.....1922

Goose Creek.

Bartlett, John L.....1921

Graham.

Long, Kenion Adam.....1921

Henderson.

Cameron, J. L.....1922

Houston.

Dwyer, Frank B.....1915
Harris, C. C.....1922
Lewyn, Isadore.....1920
Westheimer, David.....1912

Italy.

Jenkins, Cecil Lester.....1921

Knox City.

Frizzell, T. P.....1920

Lockhart.

Westmoreland, Edwin Reese, Ph.G. 1910

Lubbock.

Duering, Henry Charles.....1901

Manor.

Wentland, William Henry.....1914

Megargel.

Spoontz, J. M.....1921

McKiney.

Dulaney, Joseph Field, P.D.....1902

Orange.

Gorgee, Robt. B.....1921
Huddle, Hunter.....1920

Port Arthur.

Smith, Josiah Green.....1922

San Antonio.

Dreiss, Hermann, E. F., Ph.G...1912
Fischer, Albert Martin.....1915
Hein, Henry F.....1918
Nester, Herman August.....1909
Pfeiffer, John.....1918
Saccar, Michael, Ph.G.....1905
Simon, Leopold.....1922

San Marcos.

Shipe, Columbus A. (Miss).....1914

Spearman.

Clark, Willis Anthony.....1918

Taylor.

Carleton, Henry Lincoln.....1910

Terrell.

Overstreet. George Thomas.....1921

Troupe.

Ogletree, William Dulaney.....1920

Victoria.

Parker, Emery William.....1921

Yoakum.

Koerth, Emil Christian.....1910

UTAH.

Brigham.

Eddy, Wynn Leland.....1908

Logan.

Riter, Benjamin Franklin.....1910

Ogden.

Culley, John, Ph.G.....1908

Salt Lake City.

Dayton, Walter Henry, Ph.G...1908
Enberg, Andrew F.....1921
Harms, Herman E.....1908
Swingle, Leroy Dey.....1917
Thompson, Harry Landis.....1917

VERMONT.

Barton.

Pierce, Fred D.....1909

Burlington.

Zottman, Wm. H.....1918

Marshfield.

Gilman, Elbridge Wheeler.....1907

Montpelier.

Slade, Henry Allen.....1899

Morrisville.

Cheney, Arthur Lewis.....1907

Newport.

Livingston, Urban Smith.....1920

Rutland.

McClallen, E. Gregory.....1912

St. Johnsbury.

BINGHAM, CHARLES CALVIN.....1875
Eastman, Ralph G.....1912

Windsor.

Spaulding, Ralph G.....1921

VIRGINIA.

Appomattox.

East, H. Sheldon.....1922

Berryville

Moore, Henry A.....1922

Blacksburg.

Pedigo, Charles Lewis.....1921

Bridgewater.

Furry, Bernard Poole.....1921

Buchanon.

Henderson, Frank R.....1922

Charlotte.

Williams, Walter G.....1920

Chatham.

Thompson, G. E.....1918

Chilowie.

Greever, E. V.....1920

VIRGINIA.

Christiansburg.

Miller, Robert Leroy.....1920

Culpepper.

Kelly, Mason Powhatan.....1920

Cumberland.

Andes, Garrett E.....1922

Dante.

Haley, Henry T.....1920

Danville.

McCall, V. W.....1921

East Radford.

Hopkins, John C.....1920

Farmville.

McIntosh, Frank W.....1920

Franklin.

Gilliam, R. Carlisle.....1920

Fredericksburg.

Bowman, Dwilt Clinton.....1920
Francis, Rozier L.....1920

Gate City.

Johnson, George W.....1920

Harrisonburg.

Avis, James Little.....1905
Williamson, J. W.....1919

Leesburg.

Littlejohn, Horace.....1918

Millboro Springs.

Lowman, Jas. Lewis.....1922

Norfolk.

Goldsborough, Charles Henry...1898
Kephart, Walter Jacob.....1921
Nelligar, Frederick Dennis.....1907
Savage, Margaret E.....1921
Stier, Carl, Ph.G.....1902
Thome, Charles Carroll.....1920
Walker, Robert Lee.....1920
Wilson, Edward Claudius.....1919

Norton.

Martin, Thomas Fairfax.....1919

Pennington Gap.

Parsons, R. C.....1920

Petersburgh.

Bowman, Robert Lee.....1920
Crump, Edwin Adams.....1920
Guthrie, Charles Luther.....1920
Knock, Thomas Franklin.....1911
Partin, Robert Nelson.....1920
Smith, Robert Blackwell.....1920

Portsmouth.

Brannon, Boyce L.....1922
Clark, W. D.....1920
Schreurs, H. B., H. S., U. S. N..1917
Swann, Edwin Garner.....1919

Pulaski.

Seagle, Dexter E.....1918

Radford.

Osborne, Melmoth Mercer.....1906

Richmond.

Beach, Clifford H.....1919
Bird, Lloyd Campbell.....1920
Briggs, Andrew Gessner.....1890
Britton, F. J.....1920
Crockett, William Goggin.....1920
Curd, Thomas Nelson.....1907
Fackenthall, Philip Frederic....1920
Gilkeson, Robert Vance.....1920
Gwathmey, Richard.....1920
Harrison, Wm. P.....1920
Johann, Adam Ernest.....1910
Johann, Ernest George.....1920
Keys, Joe.....1920
Lichtenstein, Julian.....1918
Miller, Roshier W.....1920
Miller, Turner Ashby, Ph.G....1894
Miller, W. C.....1920
Monroe, John T.....1920
Monroe, Roger E.....1918
Phipps, Morris.....1917
Rosenthal, Leo.....1920
Rudd, Wortley Fuller.....1915
Seawell, Hallie Chris.....1921
Taylor, Edgar Darby.....1910
Thomas, William McClurg.....1919
Varlet, Miss F.....1920
Varlet, Miss S.....1920
Weinstein, Samuel.....1919
Winne, Arthur L. I.....1920
Worsham, John T.....1920

Roanoke.

Fox, Charles Dunsmore.....1921
Lambert, Maud, Ph.G.....1915

Rocky Mount.

Darr, Oscar S.....1920
Martin, John O.....1922

Scottsville.

Butler, Lindsay Wesley.....1922

South Boston.

Reeves, W. T.....1920

South Hill.

Burnett, Benjamin Edward.....1920

Tazewell.

Jackson, John Edward.....1918

Wakefield.

Foley, Benjamin F., Jr.....1921

Winchester.

Holtzman, Joseph Harrison.....1919

Woodstock.

Clower, Joseph B.....1919

WASHINGTON.

Ellensburg.

Nicholson, Lee Roy.....1922

Harrington.

Gilland, William Lester.....1920

LaCrosse.

Victor, Paul.....1921

Pullman.

Dirstine, P. H.....1922

Seattle.

Bissett, Rudolf Alfred.....1922
Blalock, Jesse Nelson.....1909
Cheng, Paul Yuan.....1922
Clothier, Lyle Bell.....1921
Curtis, Stanley W.....1921
Fenlon, Edwin Whitney.....1920
Guy, George H.....1921
Halverson, Clarence Bernard....1922
Henderson, Glenn William.....1922
Henderson, Miss Ruby Alice...1922
Hendricks, William E.....1921
HOLMES, HENRY ELLIOTT.....1880
Johnson, Charles Willis, Ph.C., B.S., Ph.D.....1903
Kinne, Clare Bernard.....1920
Lofgren, Frederick Valentine...1920
McRay, Emily C. (Mrs.).....1915
Needham, George Herbert.....1920
Osseward, Cornelius, Ph.C....1897
Guass, Harry Peter.....1922
Roberts, Mrs. Elizabeth.....1920
Rubenstein, Louis.....1909
Schlack, Walter Henry.....1921
Shaw, Homer Merrill.....1922
Shure, Sallo Lee.....1922
Sullivan, John Kenneth.....1922
Swift, Lester John.....1922
Tschuden, Miss Ethel Ava.....1922
Vanderbilt, Mrs. John W.....1920
Watson, Joseph Ruerson, Ph.C..1904
Werba, Peter Cyrel.....1922
Wilkes, Miss Jean Robin.....1920

Spokane.

Brown, George Elmer.....1920
Duerfeldt, Henry George.....1916
Whitlock, William Thomas.....1915

Tacoma.

Faulkner, John William.....1918
Porro, Thomas J.....1920
Rein, Tania.....1910

Wilbur.

Bandy, George, Ph.G.....1905

Yakima.

Phillips, John William.....1922

WEST VIRGINIA.

Bluefield.

Goodykoontz, Charles Henry....1909
Litz, James Edward.....1920

Buckhannon.

Young, George Orville, Ph.G....1907

Charleston.

Krieg, Arch.....1916

Clarksburg.

Haymaker, Frank Berkshire....1906

Harper's Ferry.

Dittmeyer, Walter E., P.D.....1907

Huntington.

Hron, Ralph Preston.....1915

Morgantown.

Bergy, Gordon Alger.....1917
Wood, Frank Davidson.....1915

Petersburg.

Judy, Marion H.....1920

Sutton.

Walker, Alfred.....1920

Wellsburg.

Elson, John R.....1918

Wheeling.

Adams, Harry M.....1922
Baer, Herbert O.....1916
Coleman, John.....1905
Herget, Frederick Welton.....1920
Irwin, William Wilson.....1914

WISCONSIN.

Barron.

Johnson, Leonard F.....1921

Bayfield.

Giefer, Carl B.....1921

WISCONSIN—WYOMING—DOMINION OF CANADA—ALBERTA—MANITOBA.

Burlington.

Mealy, R. Leslie.....1922

Eau Claire.

Boberg, Otto Johan Sinius.....1903
Neher, John N.....1922

Fond du Lac.

Kremer, Berthold James.....1913

Hudson.

Micklesen, Henry C.....1918

Jefferson.

Fischer, Ray Ott.....1911

La Crosse.

BEYSCHLAG, CHARLES.....1880
Williams, John M.....1918

Madison.

Chow, Ming Heng.....1921
Clark, Ralph William.....1922
Fischer, Richard, Ph.D.....1901
KREMERS, EDWARD, PH.G, PH.D.1887
Kuenzi, Ernest Gottfried.....1922
Langenhan, Henry August.....1908
Lewis, Henry.....1908
Rief, Herman Peter.....1920
Richtmann, William Oscar, Ph.G., B.S.....1904
Wakeman, Nellie A.....1918
Williams, Edward, Ph.C., B.S., M.S., Phar.M.....1906

Milwaukee.

Baldauf, George L.....1922
Bartel, Max.....1922
Eckstein, Solomon A.....1912
Emmerich, Herman Ludwig.....1922
Galbraith, Frank Harman.....1921
Keating, Frank.....1914
Kochanski, Edmund H. J.....1918
Koerner, Christian.....1922
Krembs, Ernest Maximilian.....1903
LaPiana, Victor.....1921
Lobedan, Emil T.....1922
Mentzel, Alfred F. B.....1922
Musolff, Anthony R.....1922
Raeuber, Edward Gottfried, Ph.G.....1900
Rheineck, Wm. M.....1922
Ruenzel, Henry Gottlied.....1892
Russell, H. C.....1921
SCHRANCK, CHARLES HENRY.....1876
Thatcher, Edmond Sheldon.....1917
Urban, Leopold Charles.....1912
Waldschmidt, Oliver A.....1921

Neillsville.

SNITEMAN, CHARLES CLARENCE..1881
Sontag, George Lewis.....1922

Oconomowoc.

Peters, Henry August, M.D., Ph.G. 1903

Princeton.

Mueller, Norbert R.....1917

Racine.

Horlick, Alexander James.....1904
Horlick, William.....1913
Horlick, William, Jr.....1913

Richland Center.

Pugh, Clifford Luzerne.....1920

Superior.

Ellenson, Walter William.....1921
Rydell, Otto E.....1922
Shapiro, James.....1921

Thiensville.

Seyfert, Paul.....1909

Wausau.

Albers, William W.....1909

WYOMING.

Casper.

Cook, Ray J.....1922

Cheyenne.

Roedel, Andrew Edward.....1919

Guernsey.

Thompson, Samuel F.....1921

Laramie.

Beath, Orville Andrew.....1919

Sheridan.

Tomsik, Charles C.....1922

Worland.

Schultz, R. C.....1922

DOMINION OF CANADA.

ALBERTA.

Edmonton South.

Gaetz, Halley Hamilton.....1918

MANITOBA.

Winnipeg.

Bletcher, Henry Ernest John...1904
Colcleugh, Murray Chrisholm...1913

MANITOBA—NOVA SCOTIA—ONTARIO—QUEBEC—SASKATCHEWAN—CUBA—MEXICO SANTO DOMINGO.

Connell, Thomas A.....1915
Wiberg, George.....1922

NOVA SCOTIA.

Halifax.

Burbridge, George Arnold.....1922

ONTARIO.

Guelph.

Stewart, Alexander.....1905

Ottawa.

McGill, Anthony.....1918
Watters, Henry.....1912

Stratford.

WAUGH, GEORGE JAMES.....1862

Toronto.

Graham, William Barton.....1919
Heebner, Charles Frederick.....1894
Hurst, Robert Oscar.....1916

QUEBEC.

Des Monts.

St. Amour, Omer.....1915

Montreal

Moore, Alexander Benjamin Journeaux 1914

Three Rivers.

Williams, John Lewis, Doctor Optics 1909

Westmount.

Frosst, Charles E.....1919

SASKATCHEWAN.

Saskatoon.

Campbell, Alexander.....1914

CUBA.

Artemisa.

Gavalda, Milanes Antonio.....1918

Banes, Oriente.

Tamayo, Miguel A.....1920

Camaguey.

Catala, Alfredo-Sanchez.....1919
Larrua, Francisco Hidalgo.....1922
Sanchez, Dr. Felix Enrique.....1920

Clara.

Martinez, Matilde.....1921

Cruces.

Prieto, Jose Raymon.....1915

Havana.

Abreu, Garardo Fernandez.....1907
Alacan, Armando J.....1920
Alacan, Jose P., Phar.D.....1907
Alacan, Sylvia C.....1916
Arrieta, Horacio G.....1920
Biosca, Palcido, M.D., D.S., Phar.D. 1907
Calonge, Louisa (Miss).....1916
Casas, y Bacallao Gonzales.....1920
Coll, Paula.....1916
Delgado, Joila Estrella, M.D....1915
Diaz, José Guillermo.....1907
Diaz, Dr. Manuel J.....1920
Faundo, Eduardo Garcia.....1915
Goltz, Carl Julius.....1915
Hernandez, Cartaya J.....1907
Herrera, Sergio.....1920
Johnson, Manuel.....1907
Johnson, Theodore, M.D.....1911
Noble, Dr. Ignacio G.....1922
Ortega, Pedro.....1921
Ortiz, Augustin.....1920
Pazos, y Boado Felipe.....1916
Taquechel, Eduardo G.....1920

Holquin.

Gonzales, Teodoredo M. Gutierrez 1915

Mantanzas.

Mesa, Dr. A.....1920

Palmarito de Canto Oriente.

Estevan, Alberto Soler.....1921

Preston, Oriente.

Castellanos, Baudilio.....1921

MEXICO.

Mexico City.

Braubach, Charles.....1918
Calderon, Guillermo.....1918
Potter, James S.....1916

SANTO DOMINGO.

Santo Domingo City.

Rodrigueza, Rene.....1918

MEMBERS RESIDING IN FOREIGN COUNTRIES.

(Except Canada, Cuba, Mexico and Santo Domingo.)

Abert, Moses Mordechai, B.A., B.C., M.Phm., Beirut, Syria....1916
Andrade, Caesar Daniel, Guyaquil, Equador, S. A....1918
Chapman, Oswald, Panama City, Panama....1916
Dennis, Edward G., Shanghai, China....1919
Fong, Job, Canton, So. China....1913
Hertzberg, Paul, Bordeaux, France....1920
Jee, S. H., Dr., Shanghai, China....1918
Jurado, Bolivar, Ph.C., Ph. B., Panama City, Panama....1915
Kracilshtchikuff, Solomon, Jaffa, Palestine....1921
LADAKIS, TRIANTAPHYLLO, Beirut, Syria....1907
Lang, Frank, Balboa, C. Z....1920
Lee, T. C., Swatow, China....1919
Marzouk, L. I., Cairo, Egypt....1921
McMullin, David John, H. S., U. S. N., Pago Pago, Tutuila, American Samoa....1916
Michlin, Jacob, Jerusalem, Palestine....1921
Miller, Chas. Elliott, Port de Paix, Haiti....1899
Mowradoglow, Christo, Port Tewfik, Egypt....1922
Murray, Alexander, San José de Costa Rica, C. A....1903
Pirie, Alfred Mitchell, Cartago, Costa Rica, C. A....1903
Rivera, Rafael, Caracas, Venezuela, S. A....1920
Sayed, George Abdel, Shebin, El Kom, Egypt....1921
Van der Wielen, P., Amsterdam, Netherlands....1920
Vidaurreta, Saturnino, Santa Barabara, Honduras, C. A....1921
WELLCOME, HENRY SOLOMON, London, England....1875
Wooyenaka, Keizo, Tokio, Japan....1907

DEATHS REPORTED SINCE THE PUBLICATION OF THE 1919 YEAR BOOK.

Name	Residence	Year of Joining
Benfield, Chas. Wm.	Cleveland, Ohio	1893
Blanding, Wm. O.	Providence, R. I.	1894
Cheatham, Wm. Bryant	Brooklyn, N. Y.	1917
De Forest, Wm. P.	Springfield Gardens, N. Y.	1879
HOOD, CHAS. IRA	Lowell, Mass.	1871
Hottinger, Otto George	Chicago, Ill.	1910
JONES, SIMON NEWTON	Louisville, Ky.	1870
Linton, Arthur W.	Seattle, Wash.	1901
Marks, William	New Bedford, Mass.	1920
Muth, George G.	Baltimore, Md.	1906
Neu, Daniel A.	Ridgefield Park, N. J.	1903
NEWMAN, GEO. A.	Louisville, Ky.	1866
Partridge, Frank R.	Augusta, Me.	1895
Sigler, William A.	St. Paul, Minn.	1922
Skillern, W. A.	Dallas, Texas	1920
Snyder, Ambrose Chancellor	Brooklyn, N. Y.	1867
Stolle, Henry J.	St. Louis, Mo.	1903
THURSTON, AZOR	Grand Rapids, Ohio	1886
Wall, Otto A.	St. Louis, Mo.	1884
White, Wm. D.	Wilkes Barre, Pa.	1918
WILSON, BENJ. O.	Newton, Mass.	1859

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